RAILROAD GAZETTE

FRIDAY, OCTOBER 30.

## Train Accidents in September.

The following accidents are included in our record for the month of September :

3d, a. m., freight on Grand Trunk ran into preceding freight near Portland, Me., wrecking engine and 3 cars, and injuring 3 trainmnn.

4th, p. m., passenger train on New York, West Shore & Buffalo ran into rear of freight which had stopped at Little Falls, N. Y., wrecking several cars.

5th, very early, freight on Chicago & Grand Trunk ran into preceding freight stalled on a grade near Battle Creek, Mich., wrecking 8 cars, killing a tramp and injuring another.

5th, a. m., yard engine on Denver & New Orleans ran into freight in Denver, Col., damaging several cars.

7th, p. m., passenger train on New York Central & Hudson River road ran over a misplaced switch in Buffalo, N. Y., and into another passenger train on the other track. Both engines were damaged.

8th, night, freight on Union Pacific ran into a repair train in Kansas City, Mo., wrecking several cars.

8th, night, freight on Ohio Central ran into freight car blown out from a siding at Osceola, O. The engine was damaged and engineer hurt.

8th, night, freight on Baltimore & Ohio ran into preceding freight in Shawnee, O., damaging engine and several cars.

9th, early, freight on Pennsylvania Railroad ran into preceding freight, which had been derailed a few minutes before, at Holmesburg Junction, Pa., piling up an engine and 21 cars in a bad wreck and injuring a tramp fatally.

10th, a. m., freight on Lake Shore and Michigan Southern ran into preceding freight near Youngstown, O., damaging a number of cars.

10th, a. m., freight on Pittsburgh & Western ran into preceding freight at Chewton, Pa., damaging 5 cars.

10th, night, freight on Central of New Jersey broke in two near Phillipsburg, N. J., and rear section ran into forward one, damaging several cars.

10th, midnight, freight on Intercolonial road ran into another freight, which was backing into a siding at Canaan, N. B. An engine and 1 car were damaged and an engineer killed.

12th, night, freight on Cincinnati, Indianapolis, St. Louis & Chicago broke in two near Guilford, Ind., and rear section ran into forward one, wrecking several cars. Three tramps who were in a car loaded with oats were suffocated under the grain, which was piled up on top of them.

16th, a. m., freight on Philadelphia & Reading ran into preceding freight, which had stopped near Tamanend, Pa., wrecking several cars. An oil tank burst and nearly all of both trains was burned up and 30,000 gallons of crude oil was destroyed, burning the ties and warping the rails for over a mile.

16th, p. m., freight on Norfolk & Western ran into preceding freight near Bonsack, Va., wrecking engine and 15 cars, killing one brakeman and injuring 3 others.

17th, very early, freight on Missouri, Kansas & Texas ran into locomotive, which had cut loose to run to a water tank at Hillsboro, Tex. Several cars were damaged.

17th, a. m., freight on Fitchburg Railroad ran over a misplaced switch into a construction train on a siding at Holden, Mass., damaging several cars and injuring 2 trainmen slightly.

18th, p. m., passenger train on New York, Lake Erie & Western ran into rear of coal train near Newburg, N. Y., wrecking several cars.

20th, night, yard engine on Wheeling & Lake Erie ran into rear of freight train in Toledo, O., damaging 7 cars and injuring 3 trainmen.

21st, a. m., freight on Indianapolis & St. Louis broke in two near Hillsboro, Ind., and rear section ran into forward one, damaging several cars.

25th, a. m., passenger train on Pittsburgh, Cincinnati & St. Louis ran over misplaced switch and into freight on siding at Mansfield, Pa. Three trainmen were hurt.

26th, night, coal train on Philadelphia & Reading ran into coal train which had been derailed by misplaced switch and thrown over upon the opposite track a minute before. Engine and 80 cars were piled up in a bad wreck.

27th, early, in heavy fog, wild engine on Baltimore & Ohio ran into rear of freight near Saltsburg, Pa., wrecking caboose. Fireman jumped and was badly hurt.

28th, a. m., freight on Long Island road ran into preceding freight at Hinsdale, N. Y., wrecking 5 cars. There was a dense fog at the time.

28th, a. m., passenger train on Albany & Susquehanna ran into rear of coal train near Colliers, N. Y., wrecking engine and several cars. The engine went down the bank into Schoharie River. The engineer was carried with it and drowned.

28th, night, freight on Fitchburg ran into another freight which was switching across the main track in the outer yards in Boston, damaging 2 cars.

30th, very early, passenger train on Missouri Pacific ran into some cars which had broken loose from a preceding freight at California, Mo. Engine and 3 cars were badly damaged and fireman hurt.

30th, a. m., freight on New York, Lake Erie & Western ran into preceding freight near Howell, N. Y., wrecking several coal cars.

30th, midnight, freight on Pennsylvania Railroad ran into preceding freight near Atglen, Pa., wrecking several cars.

BUTTING.

7th, p. m., butting collision between passenger and freight train on Northern Central road near York, Pa., wrecked both engines and several cars and killed a number of cattle.

8th, noon, butting collision between two passenger trains on Erie and Pittsburgh near Middlesex, Pa., wrecked both engines and 5 cars, killing engineer and fireman, injuring a trainman fatally, 3 trainmen and a passenger less severely.

14th, p. m., butting collision between freight and wild engine on New York, West Shore & Buffalo near Frankfort, N. Y., damaged both engines and injured 4 trainmen.

16th, early, butting collision between passenger and freight train on Missouri, Kansas & Texas near Hannibal, Mo., wrecked both engines and several cars. The passenger train had orders to wait for train on siding, but did not wait for an extra which was following the wrecked freight.

16th, a. m., butting collision between two freights on Chicago, Milwaukee & St. Paul near Lanark, Ill., damaged both engines and 20 cars.

17th, a. m., butting collision between two freights on Terre Haute & Indianapolis in Indianapolis, Ind., damaged both engines.

22d, night, several cars broke loose from freight on Cleveland, Columbus, Cincinnati & Indianapolis near Union City, Ind., and ran back down the grade and into the head of a following freight. The engine and 6 cars were wrecked.

23d, very early, butting collision between two freights on Cincinnati, Hamilton & Dayton, near Dayton, O., damaged both engines and several cars. One of the trains had received orders to meet the other on the siding, and did so, but failed to wait for an extra which was following, not observing the signals on the opposing train.

CROSSING.

26th, night, Chicago, Burlington & Quincy freight ran into Chicago, Rock Island & Pacific passenger train at the crossing in Ottawa, Ill., damaging a car and injuring 3 passengers.

30th, a. m., Indiana, Bloomington & Western freight ran into Indianapolis & St. Louis freight at crossing near Indianapolis, wrecking several cars and killing conductor.

DERAILMENTS.

BROKEN RAIL.

2d, early, passenger train on East Tennessee, Virginia & Georgia was derailed near Lumber City, Ga., by broken rail. Two passengers were hurt.

2d, a. m., freight on Missouri, Kansas & Texas was derailed near Bethel, Tex., by broken rail.

17th, a. m., passenger train on East Tennessee, Virginia & Georgia was derailed near Burnsville, Ala., by broken rail, injuring 3 passengers.

19th, a. m., passenger train on Brunswick & Western was derailed near Kettle Creek, Ga., by broken rail.

21st, a. m., engine of freight on Albany & Susquehanna was derailed in the yards at Oneonta, N. Y., by a broken rail.

23d, very early, passenger train on Lake Shore & Michigan Southern was derailed near Elkhart, Ind., by broken rail.

25th, a. m., passenger train on Western North Carolina was derailed near Warm Springs, N. C., by broken rail. Trainman and 2 passengers were hurt.

BROKEN FROG.

9th, very early, freight on Pennsylvania Railroad was derailed at Holmesburg Junction, Pa., by broken frog. This derailment caused another accident.

BROKEN SWITCH-ROD.

1st, p. m., passenger train on Old Colony road was derailed at Middleboro, Mass., by a broken switch-rod, and the engine tumbled over into a turn-table pit.

21st, night, freight on Wabash, St. Louis & Pacific was derailed near Raymond, Ill., by a broken switch-rod.

BROKEN BRIDGE.

6th, a. m., freight on Missouri Pacific broke through a bridge near Pleasant Hill, Mo., and the engine and 2 cars went down into the creek. The engineer and fireman were drowned.

7th, night, passenger train on Missouri Pacific broke through a bridge near Omaha, Neb. The engine passed over, but 2 cars went down and were damaged, injuring a trainman and 1 passenger.

16th, a. m., freight on Richmond & Danville went through bridge near Charlotte, N. C., and 23 cars went down into the creek and were wrecked, killing 2 tramps and injuring 2 trainmen severely.

28th, a. m., freight on Indiana & Illinois Southern broke through a trestle bridge near North Fork, Ill., and five cars went down and were wrecked, injuring a trainman.

SPREADING OF RAILS.

2d, a. m., freight on Texas & Pacific was derailed near Fort Worth, Tex., by spreading of the rails.

4th, a. m., freight on Sylvania road was derailed near Sylvania, Ga., by spreading of the rails. Two cars were damaged.

17th, a. m., passenger train on Missouri, Kansas & Texas was derailed near Alvarado, Tex., by the spreading of the rails.

21st, a. m., freight on Vicksburg, Shreveport & Pacific was derailed near Cypress, La., by spreading of the rails.

25th, a. m., passenger train on Texas & St. Louis was derailed near Garland, Ark., by spreading of the rails, and 3 passengers were slightly hurt.

BROKEN WHEEL.

10th, a. m., passenger train on Lake Shore & Michigan Southern was derailed near Burdick, Ind., by broken whel.

21st, early, 10 cars of freight on Pennsylvania Railroad was derailed near Manor, Pa., by broken wheel, injuring a brakeman slightly and a tramp severely.

29th, p. m., several cars of freight on New York Central & Hudson River were derailed at Bergen, N. Y., by broken wheel.

BROKEN AXLE.

5th, night, freight on Cleveland, Columbus, Cincinnati & Indianapolis was derailed near Muncie, Ind., by broken axle.

12th, a. m., passenger train on Texas & Pacific was derailed near Sherman, Tex., by broken axle, and 2 cars upset. One passenger was killed and 8 others hurt.

15th, noon, passenger train on Kentucky Central was derailed near Lexington, Ky., by breaking of a truck axle under the engine. The engine went down a high bank and 2 cars were piled up on top of it and wrecked. The engineer and fireman were killed, 2 trainmen and 12 passengers badly hurt.

30th, a. m., passenger train on Indiana, Bloomington & Western was derailed near Downs, Ill., by breaking of a truck axle under the locomotive. The engine upset down the bank and the whole train followed it off the rails. Several cars were damaged and 6 passengers hurt.

BROKEN TRUCK.

8th, noon, freight on New York Central & Hudson River River road was derailed near Manlius, N. Y., by a broken truck under the tender.

BROKEN BRAKE-BEAM.

10th, very early, 2 cars of freight on New York, Lake Erie & Western were derailed in Port Jervis, N. Y., by a brake-beam dropping down on the track.

ACCIDENTAL OBSTRUCTION.

9th, very early, passenger train on Delaware & Hudson Canal Co. road was derailed near Comstock's Landing, N. Y., by a rock which had rolled on the track. The engine and two cars upset, killing the engineer and injuring 4 other trainmen.

CATTLE.

6th, p. m.. freight on Texas & Pacific ran over a horse near Paris, Tex., and 6 cars were derailed. A brakeman was hurt.

22d, night, freight on Northern Central ran over a cow near Ralston, Pa., and 19 cars were derailed.

26th, p. m., construction train on Mobile & Ohio ran over a cow near Jackson, Tenn., and the whole train was derailed. A laborer was killed, the engineer and 7 laborers injured.

WASH-OUT.

9th, p. m., freight on Southern Pacific ran into a wash-out near Pantan, Ariz., and nearly the whole train was piled up in a bad wreck, injuring a trainman.

MISPLACED SWITCH.

3d, a. m., passenger train on Indiana, Bloomington & Western was derailed at Bowlesville, O., by a misplaced switch. The engine was wrecked; the engineer and fireman fatally hurt.

11th, very early, freight on Huntingdon & Broad Top was derailed in Huntingdon, Pa., by a misplaced switch. The engine ran into the passenger station, completely demolishing one side of it.

26th, night, coal train on Philadelphia & Reading was derailed near Tuckerton, Pa., by misplaced switch. This derailment caused a collision also.

29th, a. m., freight on New York Central & Hudson River was derailed in Rochester, N. Y., by a misplaced switch.

MALICIOUSLY CAUSED.

16th, night, freight on Cairo, Vincennes & Chicago was derailed by a number of ties which had been piled on the track near Stokes, Ill.

21st, night, freight on New York, Ontario & Western was derailed near Moodna, N. Y., by some ties which had been piled up on the track.

26th, a. m., coal train on Fall Brook Coal Co. road was derailed near Ansonia, Pa., by switch purposely misplaced. The switch had been opened and iron wedges driven in to keep it open.

29th, night, engine of passenger train on Wilmington & Northern was derailed at Point Lookout, Pa., by a plank which had been laid on the rails by persons unknown.

UNEXPLAINED.

8th, a. m., freight on Long Island road was derailed in Long Island City, N. Y., and 2 cars ran into a brick building adjoining the track, knocking down one side of it.

11th, night, several cars of freight on Old Colony road were derailed near Chelmsford Centre, Mass. A brakeman was killed and another injured.

12th, early, 2 cars of passenger train on Union Pacific were derailed near Como, Col., and 1 passenger was hurt. The train was running very fast on a steep grade, the brakes having failed to hold it.

14th, p. m., passenger train on Chicago, St. Paul, Minneapolis & Omaha was derailed near St. Paul, Minn., and 1 car rolled down the bank, injuring 5 passengers.

17th, early, several cars of freight on New York Central & Hudson River were derailed near Schenectady, N. Y.

26th, night, several cars of freight on Rome, Watertown & Ogdensburg were derailed near Keene, N. Y.

OTHER ACCIDENTS.

BROKEN PARALLEL ROD.

17th, a. m., engine of passenger train on New York Central & Hudson River broke a parallel rod when near Brighton, N. Y., and was much damaged.

18th, night, engine of passenger train on Richmond & Allegheny broke a parallel rod when near Scottsville, Va. The engine was damaged; the engineer was thrown out of the cab and badly hurt.

MISCELLANEOUS.

4th, a. m., oil tank car in freight on Pennsylvania Railroad exploded near Blairsville, Pa. Three cars were burned up, and a brakeman fatally hurt.

13th, very early, as freight on New York, New Haven & Hartford was near Darien, Conn., some carboys of acid in a box car exploded, wrecking that car and two adjoining ones, and injuring a brakeman. The cause of the explosion is unknown.

SUMMARY.

This is a total of 91 accidents, in which 25 persons were killed and 98 injured; a decrease of 9 accidents, as compared with September, 1884; an increase of 3 killed and a decrease of 76 injured.

The nine months of the current year to the end of September show a total of 924 accidents, 221 killed and 1,145 hurt; an average per month of 103 accidents, 25 killed and 127 injured.

A fuller statement of the totals and averages, with a summary of the causes, will be found on another page.

## Master Car-Builders' Association.

The following circulars have been issued from the Secretary's office in New York :

ANNOUNCEMENT OF COMPETITIVE TESTS OF AUTOMATIC FREIGHT CAR BRAKES.

The Master Car-Builders' Association Committee on Automatic Freight Car Brakes invite the manufacturers of such brakes to a competitive test to be held at Burlington, Iowa, on Dec. 14, 1885, and on May 14, 1886. The conditions of the tests will be as follows :

1. Each brake company to furnish, fitted with its device, fifty 28 or 30-ft. box cars of 40,000 lbs. capacity, delivering the same to the Committee free of charge at some point on the Chicago, Burlington & Quincy Railroad, on or before Dec. 7, 1885, and leave them in the hands of the Committee till after the trial of May, 1886.

2. The owners of the brakes will be responsible to the car owners for mileage made from December, 1885, to May, 1886. Between the trials the equipment will be kept on the lines of the Chicago, Burlington & Quincy Railroad, and that company will be responsible for any damage occurring to it while on its lines that come under the rules of the Master Car-Builders' Association.

3. The December tests will be made while the brake attachments are new and in good condition. No brakes will be allowed on the engine, and hand brakes only on the tank. Mechanical appliances for operating the car brakes from the engine or tank will be allowed. The brakes must be fitted to both trucks and with plain cast-iron shoes. Other details of the trial will be such as may be presented and agreed upon by the Committee prior to the trial.

4. After the December trial the brakes will be put into general service, receiving only ordinary repairs—a careful record of the cost of which will be kept. In May, 1886, the cars will be called in, and, without being prepared for trial, the December tests will be repeated.

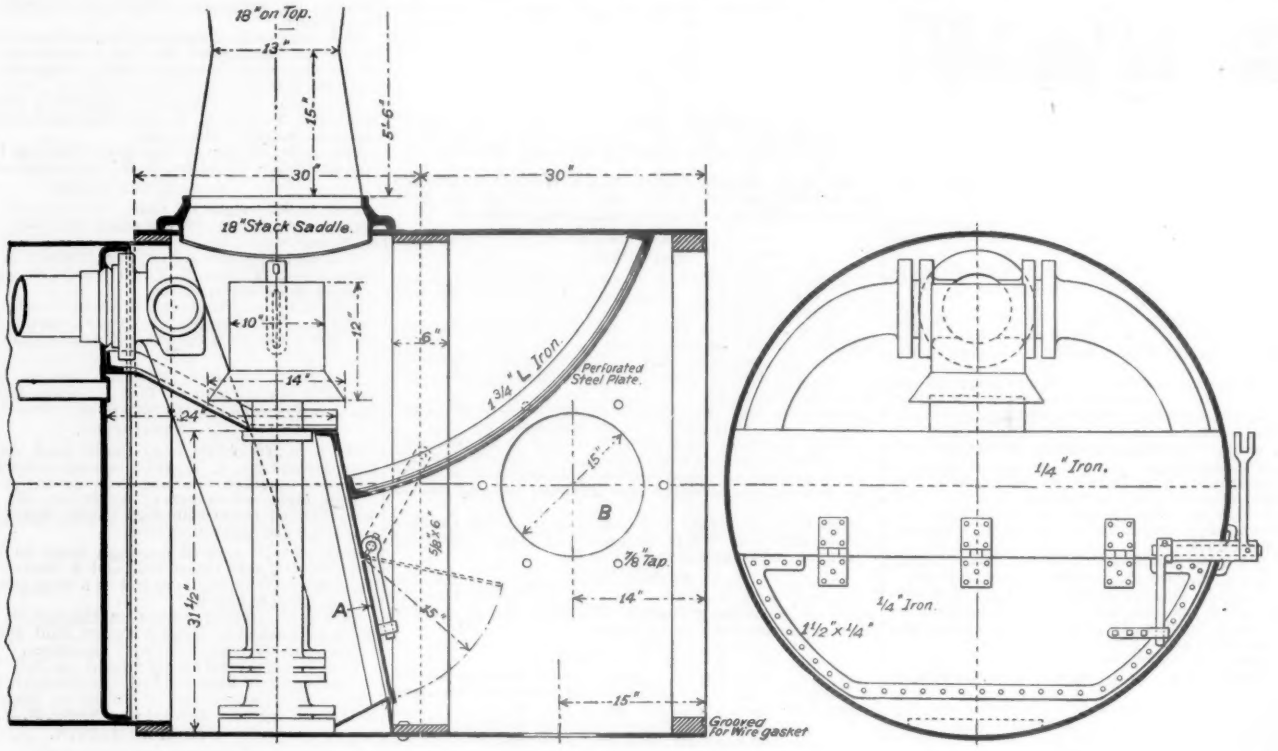
G. W. RHODES, Chairman,
GEORGE HACKNEY,
BENJAMIN WELSH,
JOHN S. LENTZ,
W. T. HILDRUP,
} *Committee.*

*Note.*—The committee will not provide equipment for these tests. Three or more competitors will be required before the tests will be entered into. Any brake company desiring to compete should at once communicate with the chairman of the committee, whose address is Aurora, Ill.

A STANDARD HEIGHT FOR MILLER DRAW-BARS.

At a meeting of the Executive Committee of the Master Car-Builders' Association, held in Buffalo on Sept. 16, the undersigned were appointed a committee to make a report to the Association, at its next annual convention, of the proper height of Miller draw-bars.

In order to report properly upon the subject, the Committee desire to know what different heights are in use and have been adopted upon different roads of the country. To assist the committee in obtaining this information, will you fill in




EXTENDED SMOKE ARCH IN USE ON THE WABASH, ST. LOUIS & PACIFIC.

the answers to the questions asked below, and forward the same to the Chairman of the Committee at Packerton, Carbon Co., Pa.

1. Do you use Miller draw-bars upon the cars run in your passenger equipment?

2. If yes, will you please state how many cars you have which are so equipped?

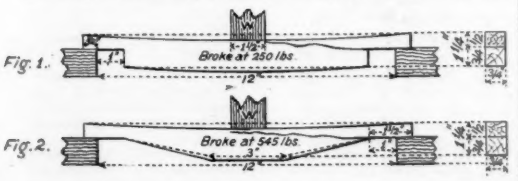
3. Please also state what is the standard height of these draw-bars as adopted by you, measured from the level of the top of rail to the centre of the Miller hook.

JOHN S. LENTZ,
ROBERT MCKENNA, } *Committee.*

## The Form of Beams.

We extract from a paper by Maj. W. B. King, United States Engineers, recently read before the American Institute of Mining Engineers, the two engravings herewith, which illustrate in a very striking way a truth which it is important to remember in designing many structures, viz., that more material does not always give more strength, and that sharp angles in anything exposed to cross strains (or, indeed, any other strains) are very injurious.

The engravings themselves give the whole data of the experiment, and hardly need description. Two specimens of Tennessee poplar (selected as a wood of very uniform quality, although not very strong) were given the shape shown in engraving, and a steady pressure was applied at *W*. The first



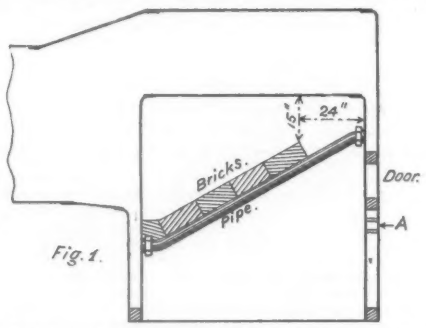

one broke with a load of 250 lbs. The second one was shaped precisely like the first *except that some of the material was cut away*, and this mere subtraction of surplus material in the wrong place increased the breaking load to 545 lbs., an increase of 118 per cent. in the strength.

The reason for this is, in a word, that the strain on the fibres is concentrated by the sharp angles all at one point, and the limit of possible extension without fracture for the parts which give most easily is soon reached. Precisely the same thing was found to occur with axles many years ago, and sharp angles in them are now religiously avoided, but the experiment we illustrate teaches the same lesson about as effectually as anything we have seen, although with iron beams the difference would hardly have been so great.

## Fire-brick Arch and Extended Smoke-Arch in Use on the Wabash Road.

The accompanying illustrations, which should have appeared last week with the letter headed Shop Notes at Springfield, represents the arrangement of the extension smoke-arch and of the fire-brick arch in the fire-box used on the Wabash, St. Louis & Pacific road. The fire-brick arch, which is being put on all the passenger engines, is laid on pipe running from the door sheet to the front sheet of the fire-box. Below the fire-box are eight 2-in. pipes (*A*) opening into the fire-box. On the outside end of the pipe are fitted sliding valves, controlled by lever, so that the amount of air to be admitted can be regulated. This arrangement is said to work very successfully, preventing smoke.

The extension arch, which is also used on the passenger engines, has given, so far, very satisfactory results. When a locomotive comes into the shop the flue sheet is set back 8 in. thus obtaining a longer smoke-arch. The diaphragm sheet *A* is hinged and operated by a crank arm, with a rod running to the fire-box. This is closed in going through cities so as to shut off all communication with the flues and the fire-box, preventing emission of smoke. The register valve *B* on the side of the arch is also operated from the cab, and should




Fire-Brick Arch as Used on the Wabash, St. Louis & Pacific.

occasion require, it can be opened and the diaphragm closed, when the exhaust carries out of the stack any sparks which may have accumulated. The ejecter principle is also used on the nozzles by adding a petticoat pipe and contracting the diameter of the stack. This improves the draft so much that the nozzle can be enlarged 5/8 in. in diameter. It is stated that a saving has been effected of two tons of coal, in a run of 180 miles. The draft is so strong that a small bolt or nut left on the netting has been carried up and out of the stack. A trial of an engine fitted with the fire-brick arch and smoke-arch, as here shown, was made on the road near Springfield, Ill., last week. A number of invited guests were on the train, and were much pleased with the performance of the engine.

## The St. John Bridge.

This splendid structure, illustrated by four engravings herewith, has for the first time afforded direct rail connection between the railroads of the state of Maine and the United States in general and those of New Brunswick and Nova Scotia. Previously, communication was broken by a ferry at St. John, N. B., where all freight and passengers had to be transferred to other cars, the ferry not being adapted to the transportation of cars.

The bridge was opened for general traffic on the first day of the present month, the opening ceremonies taking place Sept. 30. It crosses a natural site for a bridge, if there ever was one which could be called such, and the project has existed in an inchoate state almost from the beginning of railroad construction in the regions concerned, but it has been only recently that the decreasing cost of such structures and the increasing volume of the traffic to be accommodated has made it practically possible.

From its source in northern Maine the St. John River, flowing first northerly and then easterly, sweeps in a large semicircle around the highlands which form the eastern extremity of the mountain system of Maine and thence runs southerly to the Bay of Fundy. For some hundred miles above its mouth it is more an arm of the Bay of Fundy than an ordinary river (much like the Hudson River, but for the most part wider), but almost directly at the mouth of the river, for a few hundred feet only, its current is greatly contracted to pass through a narrow gateway between two solid ledges which rise abruptly a hundred feet above the water surface, and are now spanned by the structure illustrated. Through this gateway the river passes directly into the bay of the city of St. John, and thence to the Bay of Fundy at a point some 45 miles east of the international boundary line.

The well-known excessive rise and fall of the tide in the Bay of Fundy prevented the adoption of car ferriage, necessitating the complete break referred to in the railroad system at this point, passengers and freight alike having to be transferred.

As will be seen from fig. 4, the tide rises and falls 22 ft. directly under the bridge twice a day, making a current which at certain hours (unfortunately not caught in the photographs) is almost unparalleled in its violence. A cantilever or suspension bridge was therefore the only reasonable type for the locality. A highway suspension bridge just below the site of the new bridge (shown in fig. 2) has existed for many years, but the choice between the cantilever and suspension types for railroad purposes is no longer doubtful.

The main river bridge consists of a central span of 477 ft., supported on granite piers, which are 9 × 27½ ft. on top, the east pier being about 96 ft. high and the west pier about 50 ft. The cantilever arms are 143½ ft. on each side of the pier at the east side and 191 ft. at the west side, the end of the east arm being supported on masonry abutments placed in an excavation made in the solid rock, and the west arm being supported by a granite pier 8 × 34 ft. at the top and of about 40 ft. in height. The central span is 143½ ft. and is essentially an independent truss span, as in other bridges of this type, the ends being supported by the ends of the cantilevers. The depths of the trusses over the piers are respectively 65 and 80 ft. and the short arms at the ends and the centre span are each 27 ft. in depth. The panel lengths of the trusses are about 24 ft. and the track is supported on the lower chord by means of steel floor-beams 3 ft. in depth riveted between the struts and posts, and by four lines of longitudinal stringers 30 in. deep, riveted between the floor-beams. Upon these are placed the wooden ties carrying the rails, 8 × 8 in. in section and 17 ft. long, placed 8 in. apart.

The structure is proportioned to sustain a train load of 1¼ net tons to the running foot in connection with two engines weighing 45 tons each and followed by tenders each; with the usual strains per sq. in. for various parts. [The Niagara cantilever was constructed for a rolling load of two 50-ton consolidation engines followed by a train weighing 2,000 lbs. (1 ton) per lineal ft., the latter being generally felt by engineers to be too light.]

The ends of the cantilevers at the abutments are secured by anchor rods to a gridiron of rolled beams placed 27 and 32 ft. respectively below the bridge-seats at the east and west ends, upon which rest a weight of masonry amounting to about 780 and 880 tons, about three and a half times the greatest calculated upward strain with the span on the piers loaded and the shore arms unloaded. The arrangements for allowing expansion and contraction consist of a nest of rollers placed under the shore arms at each abutment, which allow the shore arms to expand and contract by simply swinging the anchor rods round the pin connection in the gridiron of beams beneath the masonry. The expansion in the centre span is allowed by slotting the upper and lower chords at the ends of the cantilever arms and allowing the centre span to swing on the vertical post which supports it at the end of the cantilever arm.

The shore arms of the bridge were erected by means of false work placed between the piers and the abutments, upon which was placed the lower chord and floor system of the span. Upon this part was erected a movable tower derrick 100 ft. high, 24 ft. long and 16 ft. wide, running on a temporary track of 14 ft. gauge, which served as a means of raising the different pieces of the shore arm and holding them in position while being connected, the hoisting of the

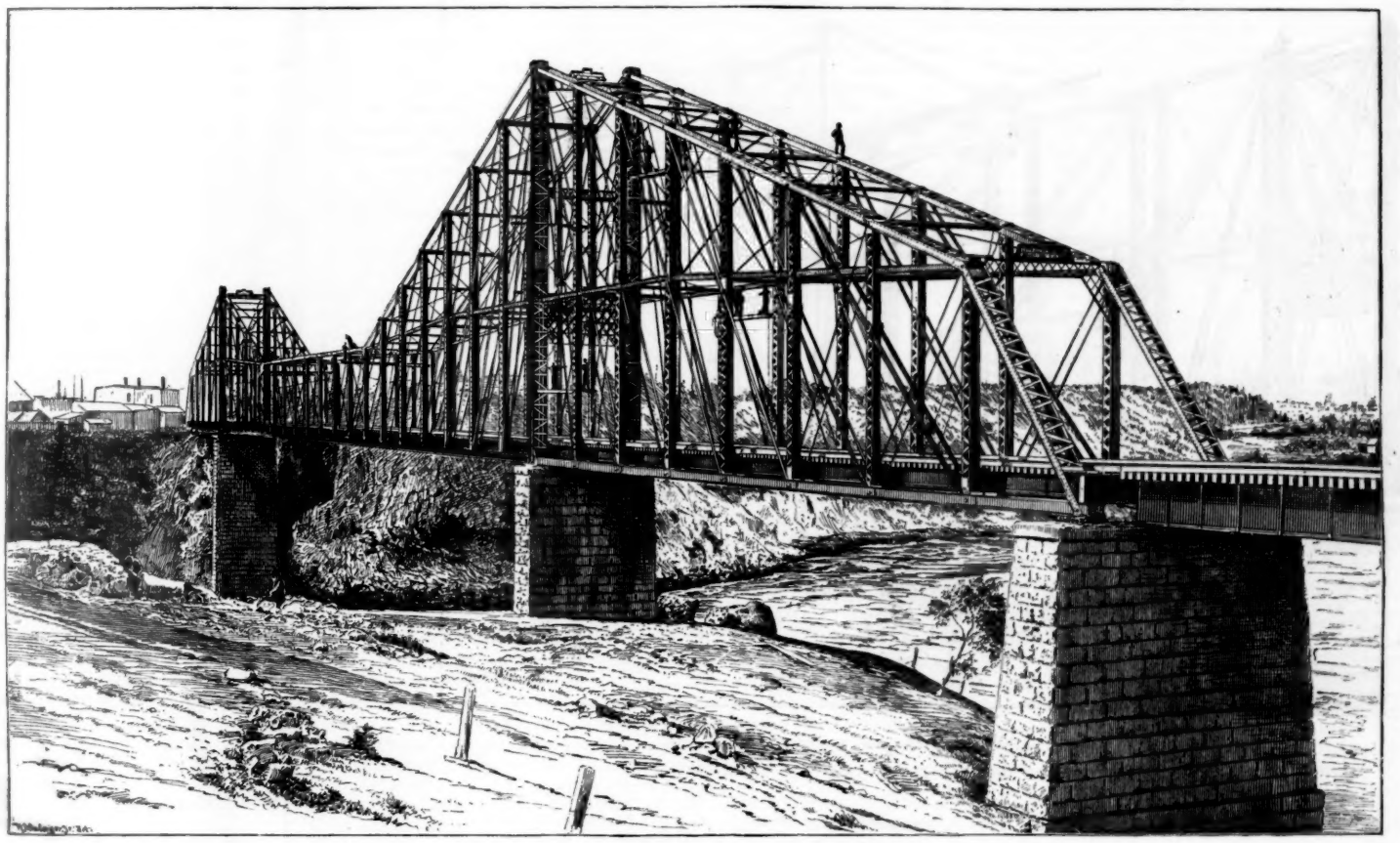


Fig. 1.—View of Completed Bridge from West End

STEEL CANTILEVER BRIDGE OVER THE ST JOHN RIVER AT ST JOHN, N. B

*The* DOMINION BRIDGE CO., *Engineers and Contractors.*

pieces being effected by means of an engine having eight hoisting winches [an engine of this type was illustrated in the *Railroad Gazette* of Sept. 4, 1885] which was placed on the track and moved along in connection with the tower derrick. The shore arms having been thus erected and the derrick brought up to the post over the pier, the traveling crane for erecting the river arm, shown in fig. 3, was raised up and set on the top of the pier post and the tower derrick was taken down and removed. The traveling crane shown in fig. 3 is 72 ft. in length, the forward portion projecting out over the river 1½ panel lengths, or 36 ft., and the rear arm being secured to the upper chord of the shore arm already erec'ed.

The tackle for raising and supporting the parts constituting one panel of the river arm was suspended from the overhanging crane and they were connected to form the complete panel, after which the crane was moved forward on temporary timbers placed between the upper chords until it rested on the post already put in position. The next panel was then completed in the same manner, and this process was continued until the centre of the river span had been reached.

The same mode of erection was then applied to the opposite side of the bridge and continued until the two spans joined in the centre. The connection between the centre span and the cantilever arms was made solid during the process of erection by means of adjusting screws at the lower chord and adjustable stirrups at the upper chord, which were so arranged that

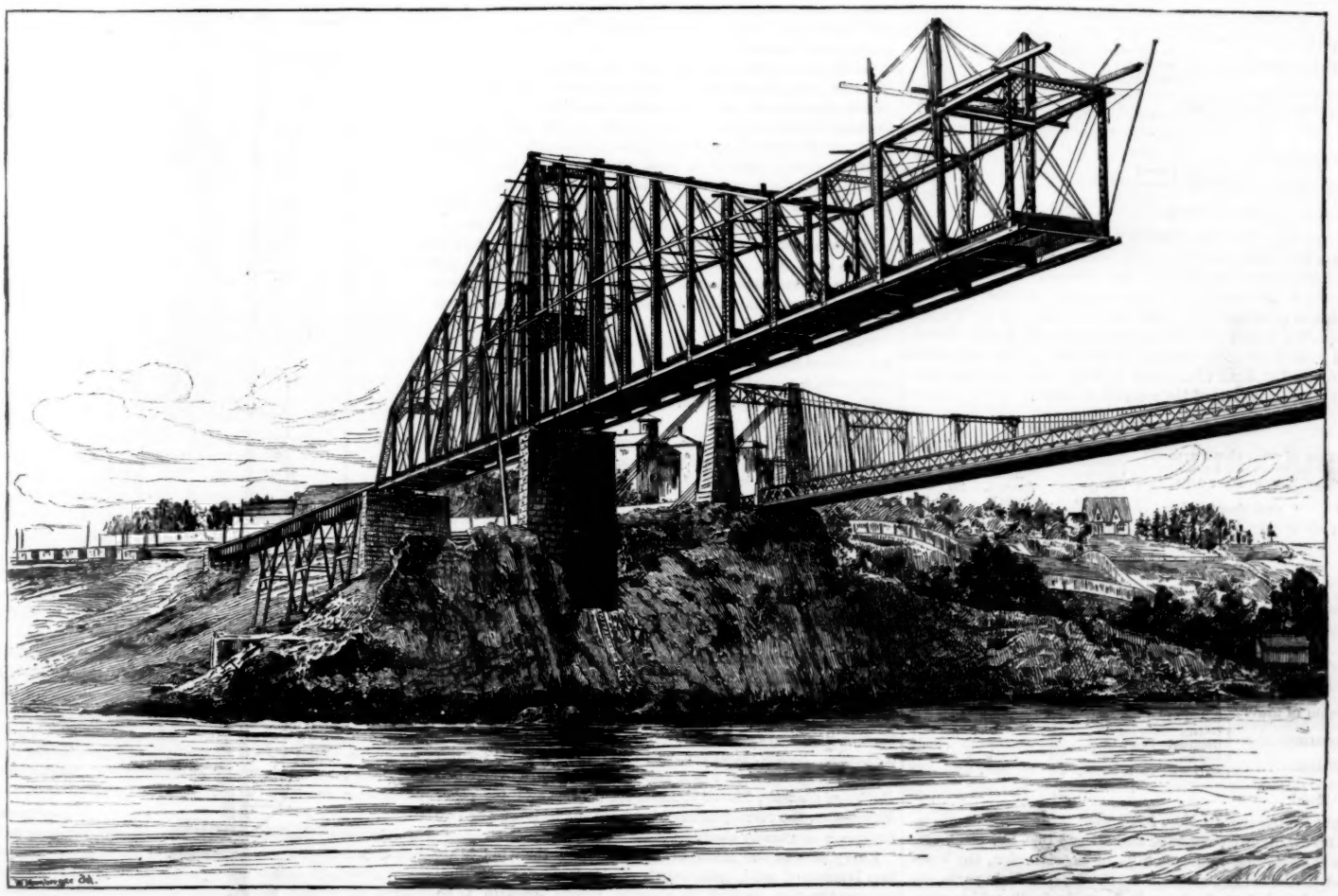


Fig. 2.—West Shore Arm and Half of River Span, as Erected, Projecting 262½ ft. Beyond Face of Pier.

STEEL CANTILEVER BRIDGE OVER THE ST. JOHN RIVER.

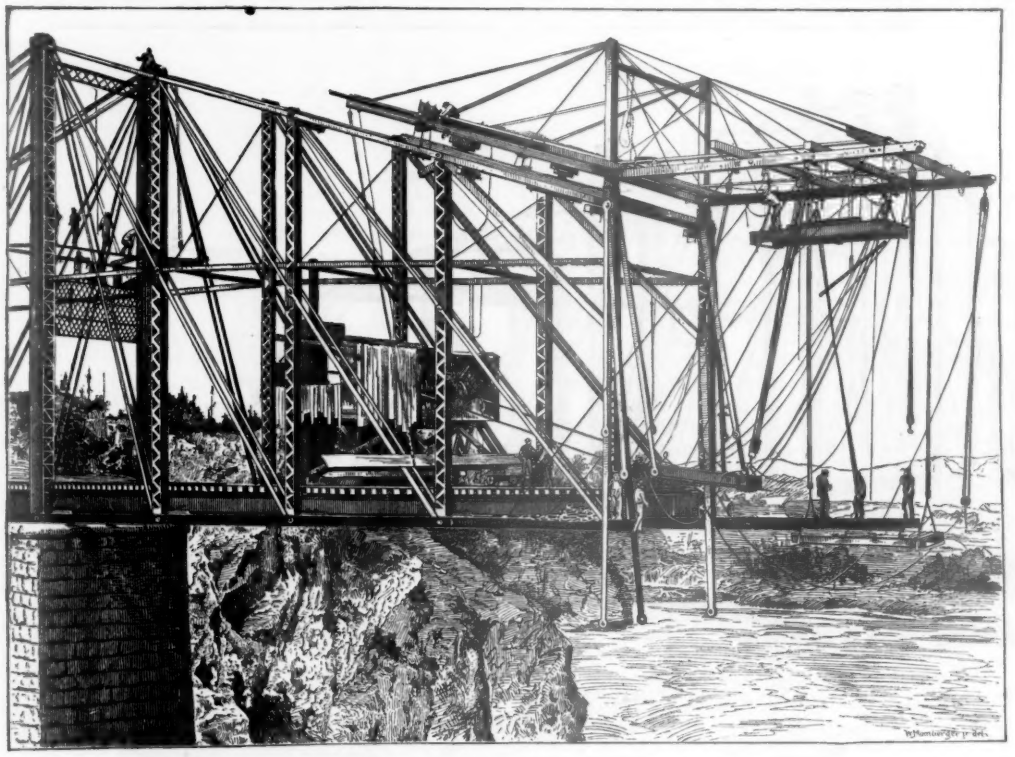


Fig. 3.—Process of Erection and Plant.

STEEL CANTILEVER BRIDGE OVER THE ST JOHN RIVER.

the two halves of the centre span could be moved in and out for the purpose of making a connection at the centre without having to make a special centre piece, as had been the previous practice in the erection of cantilever spans, and the location of the masonry and construction of the iron work were so accurately carried out that the centre connection was effected without the slightest delay or difficulty.

The chief dimensions of the bridge were in detail as follows: We add for comparison the similar details of the Niagara cantilever bridge, the nearest similar work, which was begun about the same time but reached completion some 18 months earlier:

| | St. John. ft. in. | Niagara. ft. in. |
|---|---|---|
| Length over all, centres of end pins | 812 6 | 910 1⅝ |
| Length centre span | 143 6 | 119 9 |
| Length each cantilever | 287 0 / 382 0 | 395 2⅛ |
| Length centre opening in the clear | 477 0 | 470 0 |
| Height wrought-iron towers | . . . | 130 6½ |
| Height masonry piers | 96 and 50 | 39 0 |
| Length of panels: cantilevers | 24 0 | 25 0 |
| Length of panels: centre girder | 21 0 | 24 0 |
| Width, centre to centre of trusses | 20 0 | 28 0 |
| Depth cantilever trusses: over towers | 80 and 65 | 56 0 |
| Depth cantilever trusses: over river ends | 37 0 | 26 0 |
| Depth cantilever trusses: over shore ends | ..... | 21 0 |
| Depth floor beams | 3 0 | 4 0 |
| Depth longitudinal stringer | 2 6 | 2 6 |
| Ties (white oak), centre to centre | 16 in. | 18 in. |
| Ties, size | 8 ft.×8 in. (×17 ft.) | 9 ft.×9 in. |
| Guard timbers | ..... | 8 ft.×8 in. |
| Weight (tons of 2,000 lbs.): steel | . . . | 636 0 |
| Weight (tons of 2,000 lbs.): wrought iron | ..... | 1,546.3 |
| Weight (tons of 2,000 lbs.): cast iron | ..... | 63.2 |
| Timber in floor, M. feet B. M | ..... | 153.7 |

In rapidity of erection of iron work, however, the St. John Bridge compares very favorably even with that surprising example of rapid construction, the Niagara cantilever, when the proper allowances are made, notably for the fact that work was prosecuted on both ends at once on the Niagara bridge, but from each side in succession at St. John. Where both records are so remarkably creditable, comparisons would be odious, but those who choose to make them can do so from the following details of the erection records :

ST. JOHN CANTILEVER BRIDGE.

| | | | |
|---|---|---|---|
| Erection of west shore arm | begun April 9, | | days |
| | finished May 4,* | 25 | " |
| " " west river arm | begun May 9, | 5 | " |
| | finished June 4, | 26 | " |
| " " east shore arm | begun June 6, | 2 | " |
| | finished June 21, | 15 | " |
| " " " river arm | begun June 24, | 3 | " |
| | finished July 9, | 15 | " |
| Total | | 91 | days |

* A week's time was lost in this period by a breakage of the hoisting engine.

First engine crossed July 20, 1885.

NIAGARA CANTILEVER BRIDGE.

| | American side. | Days. | Canadian side. | Days. |
|---|---|---|---|---|
| Erection of towers | Begun Aug. 29, | 10 | Sept. 10 | 8 |
| | finished Sept. 8 | | Sept. 18 | |
| Shore arms | begun Sept. 25 | 17 | Oct 8 | 20 |
| | finished Oct. 15 | 20 | Oct. 22 | 14 |
| River arm | begun Oct. 28 | 13 | Nov. 4. | 13 |
| | finished Nov. 22, | 24 | Nov. 22 | 18 |
| Total | | 84 | | 73 |

First engine crossed Nov. 31, 1883.

Whole structure completed and opened Dec. 20, 1883.

As respects the minor details of construction, the lower chord of the bridge, as well as the intermediate parts, are made of rolled steel channels 16 in. in depth which were made specially for this work, the lower chord channels being united by cover plates and lattice work and the post channels by lattice work on each side. The upper chords and main diagonals consist of forged steel eye-bars made by the Klo man process, which consists in rolling the bars with an enlarged portion at each end, afterwards forged under a steam hammer into the requisite forms of head. The blanks for these eye-bars were rolled on a special mill prepared for the purpose at the works of the Steel Company of Scotland, in Glasgow, and the hammers and gas furnaces used in their manufacture were put in especially for the purpose by the Dominion Bridge Co. at their works at Lachine, Quebec. The bars, cords and posts are united by steel pins from 5 to 7½ in. in diameter. The intermediate posts are supported near their centre by means of longitudinal struts of channels latticed together and angled between the posts, and the trusses are held against being overturned sideways by wind pressure by means of transverse tie-rods connected by struts placed between the posts at the level of the longitudinal struts to struts connected to the upper chord pins.

In the longest post on the west pier and on each side of the same, intermediate cross struts are placed between the posts and additional sway rods provided. The wind pressure against the trusses as a whole which tends to throw them out of position in a horizontal direction is resisted by three sets of lateral rods, the lower set being placed between the lower chords and beneath the floorbeams, the centre set between the longitudinal struts at the centres of the posts, and the upper set between the upper chords. Their united strength is sufficient to withstand a wind pressure of 40 lbs. per sq. ft. acting on the faces of both trusses and upon a train covering the whole length of the structure and giving a vertical face of 10 ft. to the wind, or a total pressure of 416 tons.

The bridge was tested by the government engineers July 31, less than four months after the commencement of the erection, by two trains, each having two engines weighing 60 and 65 tons, followed by loaded flat cars weighing about 30 tons each.

These trains were placed first on the shore arms without any load on the central portion of the structure between the piers, which caused a deflection of ¼ to ⅝ in. in the centre of the shore arms and an elevation of ⅜ to ⅝ in. in the centre span.

On the second loading the four engines were brought together at the centre of the centre span and the cars allowed to cover the entire length of the bridge on each side, under which load the deflection was 3¾ in. at the centre of the centre span, and less than ⅛ in. at the centres of the shore arms.

The third loading was the same as the second, except that the cars on the shore arms were removed, and under this load the greatest deflection at the centre of the centre span was 4 in., and the elevations of the centres of the shore arms were ¼ and ⅞ in. respectively for the east and west arms.

The maximum deflection of 4 in. under these loads was less than two-thirds the deflection on the Niagara cantilever bridge of the same length of centre span under a similar condition of loading, "showing considerably greater stiffness than in the Niagara bridge," it has been claimed in some accounts. Really, however, when allowance is made for the settlement of the steel tower piers of the Niagara bridge (see *Railroad Gazette*, March 7, 1884, for details) and for other differences, the correspondence between the tests of the two bridges is singularly close.

Every part of the main bridge, including the wind bracing, is made of mild, open-hearth steel. Repeated tests during construction showed its average tensile strength to be about 60,000 lbs. per sq. in., with an elastic limit of about 36,000 lbs. per sq. in. The average elongation of specimens before fracture amounted to about 32 per cent., and the re-

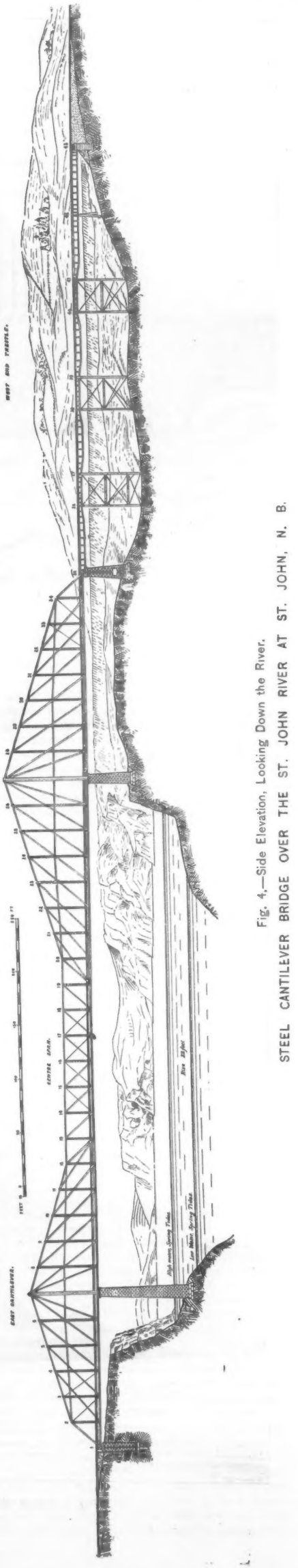



Fig. 4.—Side Elevation, Looking Down the River.

STEEL CANTILEVER BRIDGE OVER THE ST. JOHN RIVER AT ST. JOHN, N. B.

duction in area at the point of fracture amounted to about 43 per cent.

The structure is the first through cantilever bridge that has ever been erected, all the previous structures on the cantilever plan having had the track laid on the upper chord, and hence being much easier to erect than the through bridge. The manner in which the work was executed, both as regards its construction in the shops and its erection at the site, makes a very creditable record for the Dominion Bridge Company of Montreal, the joint contractors for the work with Mr. M. J. Hogan, of Quebec, Mr. Hogan doing all the masonry and substructure work and the bridge company furnishing and constructing the bridges and superstructures. The works of the bridge company at Lachine, P. Q., we may note, are of a very complete and substantial character, the main shop being wholly of brick and iron, with workroom 120 × 512 ft. in size. The steam generating and heating appliances are operated with gas made in works on the premises, and the machinery, hoisting appliances and testing apparatus are very complete.

The bridge and approaches thereto were located and constructed under the direction of P. S. Archibald, C. E., Chief Engineer of the Intercolonial Railway, with G. Brown, C. E., as Resident Engineer. The plans for the superstructure of the main river bridge and other iron work were designed by Job Abbott, C. E., President and Chief Engineer of the Dominion Bridge Company, and the construction of the work was carried out under the supervision of W. S. Thompson, Superintendent of the company's works at Lachine and formerly Chief Inspector for C. Shaler Smith, C. E., bridge engineer, of St. Louis, Missouri.

The plans for the erection of the bridge were designed by Phelps Johnson, C. E., of the Toronto works of the bridge company, and the erection of the bridge was done under the supervision of M. H. Hasler, foreman of the bridge company, assisted by F. E. Came, C. E., Resident Engineer.

The 1¾ miles of connecting line, of which this bridge is a part, include considerable heavy work other than the bridge. The total length of metal work on the whole line is about 2,260 ft., of which a short span from wharf trestle amounts to about 570 ft., a steel wharf trestle on girders 305 ft., steel roadway girders 160 ft., the main river bridge 825 ft., and the west end trestle 395 ft. Much of this trestle is barely exposed to its foundations at low water, and at high water is in 22 to 25 ft. of water. Openings of 40 to 60 ft. to serve as draws are left in this trestle to give access to various mills and lumber yards.

The total cost of the bridge, we are unofficially informed, is not likely to reach a total of more than $550,000, including in that sum the cost of 1¾ miles of connecting railroad between the New Brunswick and the Intercolonial railways, land damages and all other expenses. About $350,000 of that sum represents the cost of the main structure only, *i. e.*, that shown in fig. 4. The contract price for the Niagara cantilever bridge, we may note in the same connection, was $680,000, as has been already stated in these columns, which amounts to some 15½ cents per pound of metal (this including, however, cost of all foundations, masonry and timber), and is generally understood to cover a very handsome and satisfactory profit.

The great and rapid change which has taken place in the cost of such large structures as this is evidenced by the fact that only ten years or thereabouts ago the lowest estimates which could be obtained for the structure were $750,000 to $1,000,000, causing its indefinite postponement.

## Lubrication of Cars and Locomotives.*

### I.

The work of Josef Grossman, Engineer of the Austrian Northwestern Railroad, on "Lubricating Materials and Metals for Bearings" (Wiesbaden, 1885) treats the subjects with a good deal of elaboration, historically and analytically.

In Europe the axles of railroad rolling stock were at first lubricated with grease, following English practice.

Germany soon took to fluid oils, however, and kept on with these until towards 1850 a more viscid lubricating material was extensively used, with the object of avoiding waste by spattering. Both solid and semi-fluid greases were again given up, however, in view of the injurious effect on the tractive force required, of greater frequency of hot boxes, and of the serious difficulty of starting trains with these greases in cold weather.

About 1851, a coal-oil distilled from gas products was first used. The introduction of mineral oils was, however, very slow, owing to various circumstances; first, their volatility and consequent waste at high temperatures, causing stiffness when cool, and great spattering when warm. Another difficulty was the prejudice that prevailed in favor of oils that would make soap, which were supposed to be the only proper lubricants.

Petroleum products were first used for oiling in 1861, a European product being used. Periodic oiling soon followed, its object being the prevention of spilling through the inlets while running, and waste in oiling by inexperienced hands.

The periodic oiling was done by special hands who worked under careful oversight as to quantity used, and the oiling inlets were closed by tight joints and nuts, with various other precautions.

The economic results of the new method were really brilliant, for while in 1865 the oil for the Emperor Ferdinand Northern Railroad cost $20,786 (reckoning the florin at 42½ cents) with 581 millions of ton-miles of traffic; in 1879 the cost of oiling was $19,803, for a traffic of 1,385 millions of ton-miles. The consumption of oil had diminished from 0.0278 lbs. to 0.0154 lbs. per 100 ton-miles. In which, however, is to be taken into account that olive oil was used somewhat in 1865, while in 1879 mineral oil was exclusively in use. The North German roads gradually adopted mineral oil in the decade from 1870 to 1880, until now all freight cars are oiled with mineral oil, while passengers trains are partly oiled with rape-seed oil. The Austrian cars are now all oiled periodically, and the cars on North German roads also for the most part. Few German roads continue the practice of oiling as needed. Mineral oil made slower progress for locomotive oiling, because, in the first place, a finer quality of oil was needed, which was not so much cheaper than vegetable oil; secondly, there was more spattering from these oils; and, thirdly, at first they could only be used for cold parts of the engines, because they would not stand heat. The improvements in refining methods overcame the last difficulty to a considerable extent, and the constant reduction in the prices of the mineral oils, while the vegetable oils became dearer, gradually overcame the greater waste of the former, so that little vegetable oil is now used even for locomotives, except for cylinders and valves.

For bearings very much the same round of experiences has been gone through in Europe as in America. The approved methods at present are: First, brass bearings with recesses in the face filled with a rather hard composition of lead, tin, antimony and copper, in which the tin predominates, or tin and copper alone; second, a brass shell filled with a composition of paper, gypsum, graphite and linseed oil put in under heavy pressure. The use of the latter is limited to certain roads, but seems to be gaining ground. Phosphor-bronze has had a trial, but does not seem to have come to stay.

Herr Grossman goes over the action of bearings at some length, and shows that the advantage of using a softer metal than the journal material for the bearing lies in the fact that minute projections of the bearing are immediately ground off by the greater pressure experienced by them, while those of the journal cut paths into the bearing, thus bringing about an intimate contact over the whole of the surfaces, something after the nature of the matrimonial union in which the husband said he and his wife were one, she being the one; while the action of similar metals on each other might be compared to another sort of union, where each side alternately gains advantage at different places, with the result of increasing unevenness of surface and attrition.

He reaches the conclusion that a hard alloy is better for a bearing material than a soft one, because it experiences less wear itself; and so long as it is unable to cut or wear the journal, it has attained its object.

The wear of the bearing is not only uneconomical in itself, which is evident, but the increased area of the surface in contact—since the bearing becomes corrugated or grooved—also to some extent increases the attrition.

He considers that an alloy of 80 to 88 per cent. of copper with 20 to 12 per cent. of tin answers the above requirements. He admits the advantage of a hard shell for a bearing, with recesses filled with bearing material, which can be melted out when too much worn for use without destroying the body of the bearing. He ascribes the partial popularity of soft alloys for bearings to a misconception of the matter. Instead of attributing the decreased friction to the better preservation of the rubbing surfaces, it was attributed to the softness of the bearing. Hence it was concluded that the softer the bearing the better the action, whereas all that is necessary or desirable is softness enough to insure that the wear shall fall entirely on the bearing, leaving the form of the journal intact, to serve, as it were, for a standard to which the bearing must in general conform.

As a rule, it may be stated that apart from the oiling and load, the friction is entirely dependent on the form or condition of the rubbing surfaces, and independent of their materials; and the best bearing materials, therefore, are those which best preserve their own form while having no grinding action on the journals.

Careful observation has shown that bronze of the above composition has never worn badly, except where there has been insufficient oiling, or where foreign matters, like sand, have got in, or where the rubbing surface of the bearing has become soft through long use or from other causes.

This last exception, as given by Herr Grossman, seems a little *too* comprehensive, and calculated to cover a multitude of sins.

He believes that where bronze (rothguss metall) has been found too hard, the reason is to be sought in carelessness as to proportions in its composition, or want of homogeneity in the casting; and for this reason many roads have given up getting their bearing metal from outside parties, preferring to make it themselves; particularly as chemical tests, according to Herr Grossman, cannot settle the purity of the metals used or the homogeneity of the mixture.

One would suppose that they could certainly do the former, and that the latter could be ascertained, at least to some extent, by operating on a number of small specimens from the same piece. Of course these tests could not be extended to the actual metal used, but if satisfactory with selected specimens, they would prove in a general way the character of the whole, as in all tests of materials.

Tension and compression tests are also unsatisfactory, because they can only be tried on particular pieces; and for hardness only the surface can be tested, while the strength and uniform hardness of each piece used are of importance for its durability, an observation of the author's to which the criticism made above is also appplicable.

The character of a bronze depends upon the proportion and intimacy of admixture of the tin and copper. Tin gives hardness, but also brittleness; copper, toughness but softness. The melting point of the mixture lies between 1470° and 1650° Fahr. and grows high with the proportion of copper.

Various attempts have been made by the addition of other metals and chemicals to avoid separation of the tin, which is liable to take place in casting these alloys of copper and tin. None of these have been entirely successful. The most popular at present is the so-called phosphor-bronze, the invention of Dr. Kuenzel, of Dresden, who ascribed the unsatisfactory action to the oxidation of the tin in the process. This he prevented by adding phosphorus, and certainly produced a bronze of superior strength and hardness; but Herr Grossman does not consider it as satisfactory for car-bearings and valve faces as might be expected, while giving no particulars as to its short-comings.

Rapid cooling in various ways has been found to prevent the separation of the tin, and the principles regulating successful bronze production are laid down as follows:

First, make your alloy of the more fusible materials separately—as tin and zinc, or tin, zinc and lead. Then melt the copper and add the other alloy broken into small pieces, the copper being constantly stirred. The casting temperature should be as near as possible to the stiffening point, to secure rapid cooling in the mold. Lead compositions Herr Grossman rejects, because of their great softness and low melting points, leading to quick wear and ready destruction from running hot. Next to bronze he gives preference to the harder varieties of white metal, made of tin, antimony and copper. The proportions used—grading them by the amount of tin, their chief constituent—are, in England,

From 72 per cent. tin, 26 antimony, and 2 copper,
To 77 " " " 15 " " 8 "

while in Germany and Austria the range is

From 72 tin, 16 antimony, 12 copper,
To 94 " 4.5 " 1.5 "

In place of tin, or partially replacing it in order to save cost, zinc has been used as a base for white metal. The antimony is added to give increased hardness and the copper to counteract the brittleness of the other constituents.

In the composition of white metals the general principles above laid down for making alloys cannot be followed, on account of the small quantity of the refractory copper. The latter must first be alloyed with perhaps half the quantity of zinc or tin to be used, and the alloy so formed introduced in pieces into the rest of the tin or zinc, after melting the latter.

Hard metal bearings tend to get hot while new, owing to the action while adapting themselves to the journals, while soft metal ones only get hot when running has got them into bad condition, which occurs much sooner than with the hard-metal ones.

There seems to be some conflict between Herr Grossman's approval of bronze bearings as hard ones and his statement that in white metal the tin—which has been used to harden the copper in the bronze—has antimony added to it to make it still harder; from which the inference would be drawn that the white metal is harder than the bronze.

After discussing the various late experiments on friction in this country and in Europe, the author enters into some calculations upon the relative effect of axle-friction to the other elements of railroad resistances, and reaches the conclusion that while at 12 miles per hour the axle friction is about 18 per cent. of the whole, at 24 miles it is less than 5 per cent. In doing this he uses Hanoverian experiments on friction, which showed no decrease of the coefficient of friction for increase of speed, so that by applying more approved coefficients the decrease of this element at high speeds would be much greater. On the other hand, however, he uses for total resistances a formula deduced from Bavarian experiments in 1876, reported in a communication to the *Railroad Gazette* of June 11, 1880, by the late Baron von Weber, whereby the resistance is made to increase about as the square of the velocity, which is hardly borne out by more recent experiments, so that his results in this respect are not definite as to amounts. They indicate, however, that the axle friction is at any rate a very small element. In this connection he cites an astonishing result of the Bavarian experiments, in which by greasing the rails on the curve of 100 meters (337 ft.) radius a reduction of the total curve resistances of 96 per cent. was attained. This was cited by Weber, who wrote the first account of the result of the experiments, from the original records. He found that 61 per cent. of the total resistance due to the curve disappeared when the inner edge of the head of the outer rail was greased, and 31 per cent. more when the other rail was greased.

By reasoning based on the same data the author shows that for high speeds the advantage of good oil is less proportionally than for low ones, and less for heavy grades than for levels, which is obviously true to some extent, since the resistance of friction either slightly decreases or remains the same, while the other train resistances increase; though, owing to the doubt as to the correctness of the author's data, his deductions cannot be considered decisive as to percentages. From this follows the desirability of more perfect oiling for freight than for passenger stock, and where cars are limited in their travel to a certain district, better oil should be used on a level road than on a mountain one. Both these theoretical considerations, are, however, so much outweighed by practical ones as to be of little value in passing judgment on the relative value of lubricants.

The author shows that the old idea that the more fatty or slippery an oil is the better it is, is not entirely correct. This quality is chiefly useful is resisting the tendency of a bearing to run dry under heavy pressure, while the lubricating quality depends essentially upon the *fluidity* of the lubricant at all temperatures. Hence he lays down the principle that the first requisite of a lubricating oil is that it shall not begin to stiffen at a higher temperature than 41° Fahr. That being

*Die Schmiermittel und Lagermetalle für Locomotiven, Eisenbahwagen, Schiffsmachinen, etc.; von Josef Grossmann, Ingenieur der österreichischen Nordwestbahn. Wiesbaden, C. W. Kreidels' Verlag.

attained, he advocates fattiness as the chief consideration, because of the smaller waste and more perfect maintenance of the oiling film between bearing and journal under heavy pressure. Light machines require a more fluid oil than heavy ones, because the friction of the bearing is a more important part of the resistance of the machinery, and the maintenance of the oil film is not so difficult.

In order to get at the collective resistance of the bearings of a locomotive under steam, the author takes the following table of resistance deduced by Messrs. Vuillemin, Guebhard and Dieudonné, in which kilograms per ton of 2,204 lbs. have been reduced to pounds per ton of 2,000 lbs.:

| Table I. | Pounds per net ton. Non-coupled pass. engines. | 4-coupled engines. | 6-coupled engines. |
|---|---|---|---|
| Total resistance per ton of locomotive | 16.0 | 25.2 | 30.44 |
| Resistance of cold engine (connecting rod removed). | 6.0 | 10.44 | 12.30 |
| Percentage of latter to total resistance | 37.5 p. c | 41.5 p. c. | 40.5 p. c. |

These figures are for speeds of 17 to 21 miles per hour.

If now the collective resistance of the axle and parallel-rod bearings and of the valve gear be deducted from the resistance of the *cold engine*, as above given, the remainder will be the resistance due to rolling friction; and if this be deducted from the total resistance of the above table, the remainder will be, approximately, the total resistance of all bearings in the *engine at work*. This disregards the alternate increase and decrease of the load on the axle bearings by the action of the connecting-rod.

Assuming the axle friction coefficient at 0.009 and the proportion of the diameter of axle journal to that of the wheels at $\frac{1}{12}$, we obtain 1¼ lbs. per ton weight of engine. The friction of the valve gear of the cold engine is taken as 1 lb. per ton of engine, and the crank-pin friction for four-coupled engines at 0.2 lbs. and for six-coupled engines at 0.4 lb. per engine ton. Adding together these resistances and deducting them from the resistances of the cold engines without connecting-rods, the following table is obtained.

| Table II. | Pounds per net ton. Non-coupled passenger engine. | 4-coupled engines. | 6-coupled engines. |
|---|---|---|---|
| Total resistances per ton of locomotive | 16.0 | 25.2 | 30.44 |
| Resistance of rolling friction per ton of locomotive. | 3.50 | 7.74 | 9.40 |
| Percentage of last to the total | 21.87 p. c. | 30.71 p. c. | 30.88 p. c. |
| Resistance of oiled parts (in steam) per ton of loco. | 12.50 | 17.46 | 21.04 |
| Percentage of last to the total | 78.13 p. c. | 69.29 p. c. | 69.12 p. c. |

These figures show how large a portion of the engine resistances those of the oiled parts constitute.

With regard to the increased amounts of rolling friction indicated by the table for four and six-coupled engines, the author remarks that this is in accordance with what might have been expected, since the coupled wheels, on account of their slight difference of form and of imperfections in the track cannot roll as perfectly as the uncoupled ones, and undergo in point of fact a sort of sliding friction.

Considerable light would have been thrown on this point and on the amount of friction in the various parts if they had been successively removed from the cold engine and the effect on the resistance observed.

In the above reasoning the author obviously includes wind resistance in rolling friction, which makes no difference in the result, and his resistances of cold valve gear and coupling-rod bearings are to some extent hypothetical.

Taking two oils, one of which is twice as valuable for lubrication as the other, the use of the second, if the first were that from which the percentages in the last line of table II. were taken, would reduce these percentages to the following:

| | | |
|---|---|---|
| For non-coupled engines | 39.06 per cent. | (1) |
| " 4 " " | 34.64 " " | (2) |
| " 6 " " | 34.56 " " | (3) |

To show the effect on the economy of operation, take a six-coupled engine with a capacity of train traction of 4,400 lbs., at a velocity of 18½ miles per hour. The resistance of the engine itself, according to Table I., is 15.22 kilogs ×34 (tons in engine) = 517.48 kilogs. = 1,139 lbs. The force exerted by the engine is therefore 2,000+517.48 = 2,517.48 kilogs. (5,538 lbs). The saving effected by the better oil of 50 per cent. = 517.48×0.3456 [see (3)] = 178.84 kilogs. = 393½ lbs. The necessary tractive force to draw the same train is therefore reduced to 2,338.64 kilogs., or by 7.1 per cent., or the size of train that can be pulled by the same engine would be increased by the same percentage—this, too, irrespective of grade—so that an engine pulling 14 cars up a given grade would take 15 with the improved oil.

With a speed of 35 kilometers (21¾ miles) per hour, the same engine would pull 1,650 kilogs. (= 3,630 lbs.), and including its own traction 2,167.48 kilogs. (4,768 lbs.); while with the improved oil it would only have to exert 1,988.64 kilogs. (4,375 lbs.), or 8¼ per cent. less. This means about this percentage of saving in fuel, and this will far outweigh any possible increase in the cost of oil.

Although figures are not available for calculating the percentages of saving by better oils at high velocities, it is evident from the above that the saving stands in sharp opposition to that from using better oil in axle-boxes, since, owing to the smaller size of train possible at high velocities, the advantage of the saving in engine resistances increases as the speed of the train is raised.

The qualities suitable for axle and locomotive oiling have not yet been found combined in one mineral oil of reasonable price; and the features of a good engine oil must therefore be considered separately. These have been in general considered before as to resistance to heat or cold, that is, not to stiffen above 41° Fahr., nor volatilize under 480°, and to have sufficient viscosity to avoid waste and to maintain the lubricating film under the working pressures.

The specific gravity is of importance. It should not go below 0.880 nor above 0.940, while the oil should be free from resins, acids and impurities in general.

If a mineral oil answers the above conditions, it is preferable to any animal or vegetable oil. Being free from acid it does not tend to rancidity; it does not get thick like the vegetable oil; it cannot be used for illumination, and consequently is not very likely to be stolen—an important point.

A mineral oil complying with the condition as to high temperature as well as the other requisites is not yet in general use, if existent. Hence vegetable and animal oils are still used for the most part on the hot parts of engines.

## American Street Railway Association.

The annual convention of the American Street Railway Association met in St. Louis, Oct. 21, with a large attendance. President Calvin A. Richards delivered the opening address, showing the importance of the street railroad in modern civilization.

The Executive Committee reported the following topics for discussion:

Diseases Common to Car Horses and Their Treatment; Progress of the Cable as a Motive Power; Progress of Electricity as a Motive Power; Repair of Track; Rules Governing Conductors and Drivers; Taxation and License, and Ventilation, Lighting and Care of Cars.

It was stated that the association contained representatives from 125 companies, 23 of the number having joined during the past year. Other matters of minor importance were mentioned in the report of the Executive Committee.

According to the Treasurer's report the receipts of the association during the year were $3,212. The balance over expenses was $792.

A report on the Progress of Electricity as a Motive Power was presented by Messrs. A. W. Wright and J. A. Chase. This was discussed at the afternoon session, when reports were presented on Track Repairs by A. J. Moxham and Thomas Lowry, and on the Cable System by G. B. Kerper and A. D. Whitten. This report gave an account of the operations of the system in San Francisco and Chicago, and was followed by a long discussion.

On the second day the report on Track Repairs was discussed, and a report on Rules Governing Conductors and Drivers was presented by D. F. Longstreet and H. H. Littell, and discussed at much length. In the afternoon the delegates were taken to points of interest about the city.

On the third day a report on the Ventilation, Lighting and Care of Cars was presented by Messrs. Walter A. Jones and T. J. Minary, and called out a long discussion. The Association then elected officers for the ensuing year as follows:

President, Julius S. Walsh, of St. Louis; First Vice-President, William White, of New York city; Second Vice-President, Charles B. Warner, of Chicago; Third Vice-President, Samuel Little, of Boston; Secretary and Treasurer, W. J. Richardson, of Brooklyn; Executive Committee, C. A. Richards, of Boston, John Kilgour, of Cincinnati. John Maguire, of Mobile, Thomas W. Ackley, of Philadelphia, and C. C. Woodworth, of Rochester.

President Richards delivered his retiring address, after which Mr. Walsh, the new President, was escorted to the chair, where he thanked the members for the honor they had conferred upon him.

Cincinnati was selected as the place for the next meeting, which is to be held on the third Wednesday in October of next year.

The convention then adjourned. The meeting closed in the evening with the annual dinner, which passed off in an exceedingly pleasant manner.

## The Town of Pullman.

At the recent annual meeting of Pullman's Palace Car Co. in Chicago, President Pullman made the following statements in relation to the company's town of Pullman, near Chicago:

The situation at the town of Pullman is very satisfactory. The population is steadily increasing, and as shown by the census of July 28, 1885, is as follows: Men, 3,752; women, 1,945; children, 2,906; total, 8,603.

The number of families is 1,381. The average number of persons to each household is 6.2. The average number of children to each household is 2.1. The average number of children in daily attendance at school is 953. The death rate is 7 per 1,000 per annum, which is believed to be the lowest death rate in the world. The birth rate is 26½ per 1,000 per annum.

The average monthly rental of rooms, inclusive of all the houses in Pullman, is $3.30 per room. This includes the better class of houses occupied by officials, merchants, professional and business men.

The average monthly rental of rooms, inclusive of basements used as kitchen and dining rooms in houses occupied wholly by operatives, is $2.50 per room.

The average monthly rental of rooms in neighboring towns, occupied by manufacturing operatives, is about $2.50 per room.

It appears from the report of the Commissioner of the State Bureaus of Labor Statistics that in the manufacturing towns of Massachusetts the average rental per room is $2.86 per month.

It may be added that the houses in Pullman are built of brick, on broad, paved and shaded streets, with a perfect sewerage and drainage system, and are furnished with all modern conveniences and comforts of gas, water and complete sanitary arrangements.

The total amount of money paid to employés engaged in the following industries located at Pullman, during the fiscal year, is $2,160,141. The average number of operatives, including women and children employed, with the average earnings per day, is as follows:

| | Total payments. | Av. No. oprtvs | Av. pay per day. |
|---|---|---|---|
| Car Works | $1,328,463 | 2,329 | $1.84 |
| Town of Pullman, including brickyards, carpenter shops, railroad, farm, gas and water-works, etc. | 380,661 | 686 | 1.79 |
| Union Foundry | 358,050 | 550 | 2.10 |
| Pullman Iron & Steel Company | 65,875 | 125 | 1.70 |
| Allen Paper Car-Wheel Company | 27,193 | 51 | 1 72 |
| Total | $2,160,241 | 3.741 | $1.86 |

Or an average earning per operative per annum (310 days) of $576.60.

The average earnings of operatives at Pullman will compare favorably with those at other places.

That the employés at Pullman enjoy a reasonable degree of prosperity is shown by the following statement from the savings department of the Pullman Loan and Savings Bank:

| | No. of Acc't. | Bal. Deposit. | Average per Acc't. |
|---|---|---|---|
| Aug. 1, 1884 | 578 | $83,943 | $145.23 |
| " 1, 1885 | 625 | 98 605 | 157 76 |
| Oct. 13, 1885 | 652 | 108,200 | 165.95 |

It is fair to assume that the gradual increase in savings is, in some degree, attributable to the absence of saloons and other debasing influences, and the general healthful and moral surroundings of the place.

I desire to state here that no restrictions whatever are placed upon the employés or other residents of Pullman as to where they shall purchase their supplies, nor in any other matters concerning their welfare. Pullman is open and free to the fullest competition, and the trade of the place is participated in to a very considerable extent by the merchants of adjacent towns.

The company is in no way whatever interested in the supplies furnished to the people of Pullman.

Plans are being perfected by which desirable homes may be secured by workmen and others on the lands immediately adjoining the present improvements.

## Freight Train Brakes.

This question was discussed at the regular monthly meeting of the Western Railway Club, held Oct. 21, in the club room at Chicago.

The President, Mr. CHAS. F. PIERCE, requested Mr. Verbryck to open the discussion.

Mr. VERBRYCK: The matter of automatic brakes on freight cars is getting to be one of great importance. Since we have seen the great value of automatic brakes on passenger trains, how much safer they can be run and how much better time can be made with them than with the old hand brake, the question arises in consideration of the great amount of business on our trunk lines whether the time has not come for an automatic brake to be adopted for freight cars. If we could get a brake that would act automatically on freight cars we could run our trains with much greater speed, and could get more and better service from our freight cars. It is important that the control of the train should be in the hands of the engineer. We could not run our present passenger trains with the hand brake, and, whenever the automatic brake gives out the trains lose time with the hand brake.

The Westinghouse Automatic, the American Brake, and one or two other buffer brakes have proved more or less successful on freight trains. I have never seen a buffer brake that I considered a very great success. The Westinghouse Automatic works well on through lines, say on our California fast freight lines, and a number of roads that have cars on those lines have equipped them with the Westinghouse Automatic. But there is a great deal of difficulty about it on our local traffic. We are putting in and taking out cars from different lines where they have got to couple and uncouple those with the Westinghouse brake, and I cannot say whether it will ever be accepted as a standard.

The brakes should be put on both trucks, particularly on 20-ton cars. The wear on the wheels will more than compensate for the difference in cost. If we have the brake on only one truck of a heavy load going down grade it is a hard job to brake up the train. I am now putting hand brakes on both trucks of the cars that we are building, and all the cars with the Westinghouse Automatic are equipped with brakes on both trucks. We have not had them on long enough to determine the wear of the wheels.

Mr. Townsend agreed with Mr. Verbryck.

Mr. ANGUS SINCLAIR: The Chicago, Burlington & Quincy have had the Westinghouse automatic brake in use for upwards of a year on a considerable number of cars, and they have just let the brake run without giving it any more repairs than were actually necessary to keep it going. They have now collected enough cars to form a long train, have given them no repairs and have started out with a special train to see what stops they can make with the brakes just as they have come in after being in use all that time. That is a very good way to test the utility of the brake and show how it stands actual service, and if the same plan was followed by other companies that are using brakes of a different sort it would demonstrate what brake was really best for the rough work of freight service.

Mr. SMITH: The committee of the Master Car-Builders' Association have recently issued a circular on the subject of automatic freight car brakes, inviting the manufacturers of brakes to a competitive test to be held at Burlington, Iowa. The first test will take place in December and the second one in May; no test shall be made unless three different styles are offered; each brake company competing is to furnish 50 cars fully equipped with their brakes; and deliver them at their own expense at Burlington; tests are then to be made with the brakes while they are new, they are then to be put in service, watched by the officers of the road and the members of the committee until May next year, when they are to brought in and again tested; the owners of the brakes will be held responsible for the mileage made by the cars during the time from December to May.

Mr. VERBRYCK: This is rather a delicate subject for me to express an opinion upon. The *Railway Review* thinks the committee are rather extravagant in their views, and ask too much of the patentees of brakes. I do not know why it should be; that is, if they are all willing to do as the American Brake Co. is, equip a train and go all over the country experimenting. Fifty cars is perhaps rather too many; possibly 20 cars might do. The Rote Brake Co. are willing to equip a train at their own expense for any road that will allow them to do it. We already have the Westinghouse brake, and it would not be necessary for them to do it, and so far as these other companies are concerned, I do not know why they should not be willing to equip say 20 cars and submit them to the Master Car-Builders' Association.

Mr. SMITH: The brake companies are expected to furnish the cars, equipped complete, and leave them for a long time.

Mr. VERBRYCK: As the Westinghouse brakes are already on the cars, the railroad companies might furnish the cars and the brake companies equip them. Possibly the increased service that we would get out of our freight cars by running them very much faster than we at present do with the hand brake would more than compensate for the expense for keeping the brake up. I am not at present satisfied that a buffer brake can ever become the standard brake for freight cars in this country. The draw rigging of a car is about the first thing that gives out, and has to be adjusted exactly to make the brake effective, and, consequently, if anything in the draw rigging gives out, the brake is useless.

We equipped ours last winter, have only had to repair a few hose.

Mr. MACKENZIE: The secret of the success of all buffer brakes is the wear and tear on the engine. With the American brake on 16 cars we could stop in less than half the distance that we could with three good, strong brakemen on the same cars. The brakemen complained that it was caused by the brakes being adjusted for the draw-bar brake, that they could not apply the brakes strong enough; so we got 16 other cars and reversed the engine to help them out, and the distance was about the same. In one of our tests the brake-rod upon the tender broke, and consequently it ran over 800 ft. at the same speed, showing that the work was

done entirely, or nearly so, with the engine. With the brakemen and tender brake and driver brake we made nearly as good a stop as with the driver brake, but we could stop the engine before those men could be got upon the top of the train. That was the advantage of that brake over the ordinary common hand brake.

Mr. SINCLAIR: Driver brakes cause brakemen to neglect their work and have been consequently removed from all engines on a Western road.

Mr. MACKENZIE: That is not our experience with the driver brake. We have 32 engines equipped with it, each hauling 50 loaded cars, and no engineer on the road would handle one of those trains without the driver brake. The order is that when it is necessary to put the brake on, to put it on for all there is in it. A driver brake, steam or air, is a great thing on a railroad. The other day we saved a man's life by the use of it. They save bumpers in the yard, and assist in the running of the trains on the road, but are very hard on an engine.

Mr. TOWNSEND: We would save life and limb by having automatic brakes on freight cars, and the time is coming when railroad managements will see the importance of having their cars equipped for the increasing traffic and so as to run very much faster.

Mr. MACKENZIE: Running nearly 15 miles an hour, we stopped in 1,600 ft. with three brakemen and the conductor all putting the brakes on. With the assistance of a driver brake, we stopped in 900 ft. The 1,600 ft. was an extraordinary stop; the best they can do generally is a quarter of a mile (1,320 ft.).

Mr. VERBRYCK: If we could have a good automatic brake on freight cars it would not be necessary for the brakemen to be running over the tops of the cars to set brakes. It would save a great deal of injury to the brakemen, particularly in the winter time, when the running boards are covered with ice and snow and the brakemen partially benumbed with the cold. Many accidents are caused by that, even if nothing gives way in the brake rigging. In my new cars I am putting on a guard around and outside the brake staff to save the brakemen in case anything happens to the brake rigging.

Mr. SMITH: When a train breaks in two with bumper brakes, they can stop the train only by the brakeman going ahead and setting the brakes, whereas with automatic brakes, the brake applies itself to the rear end of the train and stops it. The recent accident to a circus-train on the Northern Pacific road is an illustration.

Mr. VERBRYCK: If a train breaks in two these buffer brakes are of no use to the rear part of the train, except as Mr. Smith said, but the brakeman is not always there to set the brake, he may be in the caboose and have to run over the whole length of the train to set the brake. That is one advantage of the Westinghouse brake; it sets automatically and stops the rear part of the train.

## TECHNICAL.

### Locomotive Building.

The Rhode Island Locomotive works in Providence have just completed a locomotive of the Forney pattern for the Boston & Providence road. They are also building two mogul freight engines for the Ogdensburg & Lake Champlain road.

### The Car Shops.

The car works of the Wells & French Co., in Chicago, are again in full operation after the disastrous fire of July 20. Rebuilding began Aug. 25, and a number of cars were turned out before the end of September. At the time of the fire the company had a contract for 1,000 cars about one-half filled. This has since been nearly completed, and other contracts, amounting to about 300 cars, are now under way.

Harris & Co., in St. John, N. B., are building 200 box and 300 flat cars for the Intercolonial road.

### Bridge Notes.

The Morse Bridge Co. in Youngstown, O., has recently received contracts for several large bridges.

Arrangements are being made to start up the extensive bridge works of Rust & Coolidge, in Chicago, which have been idle for several years. The works, it is understood, will be run by Eastern parties, whose names have not been made public.

The Keystone Bridge Co., of Pittsburgh, has opened a branch office in Chicago, in charge of Mr. C. L. Strobel, Consulting Engineer.

The King Iron Bridge & Manufacturing Co. in Cleveland, O., has taken the contract to build a bridge over the Sabine River at Logansport, La., for the Houston, East & West Texas road.

### Iron and Steel.

The Leesport Furnace at Leesport, Pa., will shortly go into blast, after a stoppage of six months.

The Carbon Iron Co. at Parryville, Pa., will shortly put an additional furnace in blast.

Gen. Beaver and associates are making arrangements to build a large blast furnace near Bellefonte, Pa. This furnace will use coke as fuel.

Charlotte Furnace at Scottdale, Pa., has gone into blast, after a stoppage of eight months. During the stoppage the furnace has been rebuilt.

The Falcon Iron & Nail Co. in Niles, O., is about to build a sheet iron mill adjoining its present works.

The Moundsville Rolling Mill at Moundsville, W. Va., has been sold to Joseph D. Weeks, of Pittsburgh.

The works of the Union Iron & Steel Co. in Chicago are to be started up about Nov. 1. The rolling mill is now completed and the blast furnaces are already completed.

### Manufacturing and Business.

The firm of Gardner, Holmes & Co., manufacturers of perforated car seats and ceilings, has been reorganized under the title of Gardner & Co. The members of the firm are Messrs. William, John M. and Samuel H. Gardner, and the office and factory are at Nos. 643 to 957 West 48th street, New York city. The firm state that the demand for their goods is now fully 15 per cent. greater than at this time last year. To meet the increased demand they have enlarged the capacity of their works, now having 40,000 square feet of floor space, and entirely new machinery in every department.

The Westinghouse Machine Co. in Pittsburgh has just received an order from the Otis Iron & Steel Co. of Cleveland, O., for four Westinghouse engines of 200, 35, 25, and 8 horse-power respectively. This is the tenth order received from the Otis Co. within three years. The 200 horse-power engine is 18x16 in., and will be coupled directly to a train of rolls making 300 revolutions. The Pennsylvania Steel Co. has also recently ordered a 50 horse-power Westinghouse engine, being the sixth order within three years.

### The Rail Market.

*Steel Rails.*—The *Iron Age* says: "The demand is quite equal to the supply, and prices show an advancing tendency. Small lots are quoted $31@$31.50 at mill, and large lots $30@$30.50, with orders sufficient to run the mills until about March. Of course the allotment will be increased, providing that more rails are required than was thought probable at the time of the Long Branch meeting, so that there is no danger of scarcity, although at $30 they are scarce already. Higher prices appear to be expected in the near future."

*Rail Fastenings.*—Spikes are quoted at 1.90 cents per pound in Pittsburgh; track-bolts 2.55@2.85 and splice-bars 1.60@1.70. Some improvement in the demand is reported.

*Old Rails.*—Old iron rails are quoted at $17@$17.50 per ton at tidewater, with light supply. Old steel rails are scarce and are quoted at $17.50@$18,50 per ton in Pittsburgh.

### British Rail Exports.

For the month of September and the nine months then ending, the exports of steel and iron rails from Great Britain to the United States and to all countries have been, in tons of 2,240 lbs.:

| | September. | | | Nine months. | | |
|---|---|---|---|---|---|---|
| | 1883. | 1884. | 1885. | 1883. | 1884. | 1885. |
| *To United States:* | | | | | | |
| Iron rails .... | 50 | 7 | ..... | 2,569 | 7 | ..... |
| Steel rails.... | 6,508 | ..... | 228 | 51,302 | 16,118 | 5,071 |
| Total .... ... | 6,558 | 7 | 228 | 53,871 | 16,125 | 5,071 |
| *To all countries:* | | | | | | |
| Iron rails..... | 1,100 | 1,424 | 1,993 | 21,202 | 10,747 | 11,263 |
| Steel rails.....63,242 | | 34,232 | 38,536 | 579,421 | 421,206 | 396,547 |
| Total. .....64,342 | | 35,656 | 40,526 | 600,623 | 431,953 | 407,810 |

The exports to this country for the nine months were not one-third as great this year as last, and not one-tenth as great as in 1883.

The exports to other countries in September were larger this year than last, but for the nine months they were slightly greater last year. As in previous months, India led in September, taking 32½ per cent. of the total exports in September and 33 per cent. for the nine months; Canada, which stood next, taking less than half as much, and Australia a little less than Canada—together 255,525 of the 407,810 tons exported in the nine months.

### Brake Tests.

A public test of the Waldumer electric brake was given on the Cincinnati, Washington & Baltimore road near Cincinnati, Oct. 22, a number of railroad officers and other invited guests being present. The train consisted of the locomotive, a baggage car, three passenger cars and the officers' car of the road. Several stops were successfully made, the best being on a down grade of 68 ft. to the mile, where the train was stopped in 700 ft. from a speed of 40 miles an hour.

### Premiums for Stock and Refrigerator Cars.

The Illinois State Board of Agriculture has called the attention of the owners of refrigerator and palace live stock cars to the premiums to be awarded at the forthcoming American Fat Stock and Dairy Show, to be held here Nov. 10 to 19. A. M. Simmons, of Chicago, offers a gold medal for the best refrigerator car for the transportation of beef and dairy products, awards to be based on the following points: 1. A record of the longest continuous transit during the months of July or August, without re-icing or use of salt of a car loaded with fresh beef or dairy products. 2. The least variations of temperature from the time of loading the car with either dressed beef or dairy products until the same was unloaded without re-icing or use of salt.

J. H. Sanders, of the *Breeders' Gazette* of Chicago, offers a gold medal for the best patent live-stock car for the transportation of horses, awards to be based on the following points: 1. General strength and durability of construction. 2. The adjustment of springs and brakes that insures the greatest comfort to animals when the train is in motion, and most effectually prevents injury in standing and stopping. 3. Convenience in loading and unloading stock and watering and feeding stock in transit. 4. Facility in constructing single stalls into double and triple in case of sickness or accident. 5. Economy of space. 6. Carrying capacity in numbers. 7. Perfection and convenience of ventilation.—*Chicago Inter-Ocean.*

### The New Extension of the New York Elevated Roads.

Much progress has been made in the work of building the railroad of the Suburban Rapid Transit Co., and signs are already evident of the important effect which the enterprise will have in the development of property and business in the annexed district. This company was organized under the General Rapid Transit Act, in 1880, by Commissioners appointed by Mayor Cooper. Its roads and connections, when completed, will form a very extensive and valuable addition to the rapid transit system of this city. The route, starting from 129th street, where it connects with the Second and Third avenue elevated roads of the Manhattan Co., crosses the Harlem River upon a drawbridge 24 feet above high water, and passes over the freight yards of the Harlem River & Portchester Railroad, to a point on the Southern Boulevard, about midway between Willis and Alexander avenues. It then runs northerly, through the blocks, to 144th street, where it forks. One of the branches, turning to the west and crossing the Harlem Railroad at about 152d street, then goes northerly between the Harlem Railroad and Central Avenue to Jerome Park. At about 160th street a connection is made by a cross line with the railroad bridge across the Harlem River at Eighth avenue. The easterly line from 144th street runs to St. Mary's Park and thence northerly, about half a mile east of Third avenue, along the easterly border of Crotona Park, and through West Farms, to the Bronx River and Bronx Park, near Pelham Avenue.

An intermediate line, beginning near Brook avenue and 146th street, runs nearly parallel with Third avenue and a few hundred feet east of it, and along the westerly border of Crotona Park, to Fordham, and thence easterly to the Bronx River crossing of the easterly line.

The structure of the road is now completed to the Southern Boulevard. The drawbridge across the Harlem was built by the New Jersey Iron & Steel Co., after plans designed by Mr. Theodore Cooper. It is 245 ft. in length from end to end, 26 ft. in width from centre to centre of trusses, and 20 ft. deep in clear at the ends. It has a double-track railroad in the centre and a foot-walk 6 ft. wide at each side. The piers are of masonry, supported in some cases upon a good natural foundation, and in others upon piles and concrete. The elevated structure across the yards of the Harlem River & Portchester Railroad includes not only the two tracks of the Suburban Rapid Transit Co., but a double track descending to meet the grade of the Harlem Road, thus enabling passengers over the latter road from New Rochelle and the intermediate suburban stations to be transported directly across the river to the Manhattan Railway. This elevated structure and the Suburban tracks to the Southern Boulevard have been built by Alden & Lassig, of Rochester. The first mile and a half of the road from the Harlem River is elevated to from 12 to 20 ft. above the surface of the ground. The section between the Southern Boulevard and 144th street, which is now in process of building, consists of iron girders, supported on brick piers, about 16 ft. above the ground level. The stations will be in the blocks, between the tracks, and will be approached by stairways from the sidewalk.

For about a mile above 144th street the general character of the structure will be the same as below. After striking the more undulating country, the road will be partly elevated and partly depressed, crossing all streets either above or below grade. Where the road is depressed, it will run in open cuts. Throughout its entire length the road will pass through property purchased from private owners, in no case running through public streets or avenues. Considerable progress has been made toward acquiring title to all the land needed along the route, and a commission appointed by the Supreme Court is now taking testimony in cases where the owners and the railroad company have been unable to agree upon terms.

It is expected that trains will be running over the lower part of the Suburban road, connecting with the Manhattan elevated system, within a few weeks, and to 144th street by next spring. The cars have already been built by the Pullman Car Co., of Chicago, and the locomotives are now building by the Baldwin Locomotive Works, at Philadelphia. The locomotives will weigh 25 tons, being heavier than any now in use on elevated roads. All of the structures of the Suburban Co. will be strong enough to bear the ordinary passenger locomotives in use on surface roads, so that out-of-town trains from surface roads can be brought directly over the bridge.

The Suburban Rapid Transit Co. is an independent organization, and has no relation with the Manhattan Railway Co., except those of a connecting road.—*New York Evening Post.*

### Spread of the Interlocking Switch and Signal System.

The Union Switch & Signal Co., of Pittsburgh, has recently completed and put into service the following interlocking machines: An 80-lever machine at the east end of Union Depot, Kansas City; a 13-lever machine at Chicago & Alton Junction, and an 8-lever machine at Harlem Junction, all on the Hannibal & St. Joe R. R., at its junctions with the K. C., St. Joe & C. B. R. R., the Chicago & Alton R. R. and the Wabash. A 22-lever machine at St. Paul, at the crossing of the St. Paul, Minneapolis & Manitoba with the Wisconsin Central. A 12-lever machine at Bridge 286A over the Des Moines River, on the Chicago, Burlington & Quincy. Three machines at South Framingham, Mass., aggregating 61 levers, governing the crossings of the Boston & Albany and the Old Colony, together with the switches in their yards. A 28-lever machine at Hillen Junction, Baltimore, on the Northern Central, a 36-lever machine at Bridgeport, Pa., near Harrisburg, at the crossing and junction of the Northern Central with the Cumberland Valley, and a 2-lever machine at Sunbury, Pa., on the Northern Central. An 8-lever machine at Bridge 5, near Phillipsburg, Pa., at the crossing of the Beech Creek, Clearfield & Southwestern with the Tyrone & Clearfield Branch. A 9-lever machine at Medfield crossing of the New York & New England with the Old Colony. An 11-lever machine at Palmer, Mass., at the crossing of the Boston & Albany with the New London Northern. A 10-lever machine at Hawleyville, Conn., at the crossing of the New York & New England with the Housatonic road. A 13-lever machine at Wilmington Junction, Mass., of the Boston & Maine with the Boston & Lowell. A 10-lever machine and a 12-lever machine at South Ferry station on the Manhattan Elevated line in New York. A 9-lever machine at Centre street, Newark, N. J., on the Pennsylvania Railroad.

The company has orders on hand for a 20-lever machine at Westfield, Mass., at the crossing of the Boston & Albany with the New Haven & Northampton. An 11-lever machine at Woburn Branch Junction of the Boston & Lowell. An 11-lever machine at the Fulton Ferry terminus of the Brooklyn Elevated. A 16-lever machine at the Manhattan Beach terminus of the Brooklyn Elevated, also for making additions to and rearranging the interlocking at east leg of Mantua Y on the Pennsylvania Railroad. Two 6-lever machines at the draw-bridge of the Old Colony road at Somerset, Mass. A 12-lever machine at Montvale yard of the Boston & Lowell. A 15-lever machine at Winchester Junction of the Boston & Lowell. Also large contracts for block-signals on the Old Colony and Boston & Albany roads.

### Cable Cars in Philadelphia.

The cable car accident on Saturday evening was of a very ugly kind, and, if likely to occur often, would be fatal to the system. A runaway car (for that was what it was in effect) would be an exceedingly dangerous thing in the crowded parts of the city where people and vehicles are continually crossing the track. Even as it was, out at the end of the line, there appears to have been insufficient warning given to the people in the car immediately in advance of it. The indirect consequences of the accident were quite serious to the company and to the public. Before the line could be cleared to admit the free passage of the horse cars the hour had arrived when crowds of people were flocking eastward to the theatres or westward to the Novelties Exhibition. Several cars had to be thrown from the track, and hundreds, if not thousands, of people were delayed in getting to their destination. Making every possible allowance for the friction of early experiments, the cable system has proved to be very uncertain. It seldom runs two days in succession without some kind of accident or break down. In other respects it is a great convenience. The cars are roomy and enable the company to give more accommodations to passengers, and, barring the delays of accidents, they make good time, notwithstanding the presence of horse cars on the same track, the latter being pushed to quicker trips to accommodate the motors. The cable system is getting a very fair trial in Philadelphia, both from the Traction Company and from the patient public, but the succession of accidents is calculated to shake faith in its ultimate success.—*Philadelphia Ledger, Oct. 26.*

### Putting the Wires Underground.

Workmen in the employ of the Standard Underground Cable Co., of Pittsburgh, were busy all day yesterday and last night tearing up the pavement along Houston street, from Mercer to Mulberry, and along the last named street to the front of Police Headquarters, forming a trench in which an experimental electrical cable will be laid connecting the headquarters of the Police and Fire Departments. A trench about 4 ft. deep was dug along the gutter on the north side of Houston street, in which a wooden box to contain the cables will be laid. The cables consist of six insulated copper wires pressed in a malleable lead pipe and laid side by side in the boxes. The latter when closed up are to be covered with roofing pitch. All the wires of the fire alarm telegraph running out of the headquarters in Mercer street are to be removed from the tall masts in front of the building and connected with the underground cables, and the police telegraph wires are to be similarly treated.—*New York Times, Oct. 26.*

### An English Railroad Tricycle.

A novelty has been executed at the Lancashire & Yorkshire Railway carriage works, in the form of a railway tricycle, with four seats in front, with springs, etc., like an ordinary tricycle, so as to allow four drivers to work with their feet the two large driving wheels. It is estimated to attain a speed of 20 miles an hour, and, being fitted with a handy brake, can be stopped at any point required by the engineers of the company in their tours of inspection. There are also two benches, with boxes for tools, etc., underneath, made to seat half a dozen platelayers when required. Handles are affixed at both ends, so that three or four men could easily lift it off the rails. Hitherto this work has often had to be done with a platelayer's bogie propelled by feet touching the road. It has been made for the Preston & Wyre Railway.—*Herapath's Railway Journal, London.*

RAILROAD GAZETTE

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## EDITORIAL ANNOUNCEMENTS.

**Passes.**—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

## RUMORS CONCERNING THE TRUNK LINES.

There are rumors of various new developments among the trunk lines which may have some basis of fact. One of these is that Mr. Vanderbilt will be represented in the Erie board to be elected in about three weeks, and will hereafter exercise a controlling influence in that company. That Mr. Vanderbilt should be represented in the Erie board seems probable enough, but it is not at all probable that he or his associates have become owners of anything like a controlling interest in the Erie Company. More money would be required for that than even Mr. Vanderbilt would be likely to spend to secure control of a company which is not likely for a long time, if ever, to pay dividends on the stock through which the road is controlled. But it would probably be regarded as a good thing both for the Erie and the New York Central if Mr. Vanderbilt should take some interest in the Erie property, and some part in its management, because it would seem to commit his powerful influence in favor of the prosperity of that road. It may very well be, therefore, that the Erie stockholders will give him a considerable voice in the management of their road, if he takes any important amount of its shares or bonds, or assists it out of its financial difficulties, purely for their own benefit—because it would help the road through its difficulties by giving it better credit, give it better chances of increasing its profits, and cause their shares and bonds to bring better prices in the market. Of course, it is not impossible that something of the nature of a lease has been arranged for.

Apparently as a part of this programme, it is reported that the Erie will interchange St. Louis business with the Cleveland, Columbus, Cincinnati & Indianapolis, instead of the Ohio & Mississippi. The whole distance by the former is 1,164 miles from New York to St. Louis, and by the latter 1,238 miles, but the Erie would have 105 miles more haul by the Ohio & Mississippi route. There was recently a prospect that the Baltimore & Ohio might lease the Ohio & Mississippi and thus deprive the Erie of its St. Louis line, but the prospect now is that the Ohio & Mississippi will remain independent, and that the Erie will continue to be able to do business over it just as it has done heretofore. There has also been a report that the Erie would have the Nickel Plate as a western connection to Chicago. The Erie once had a freight line over this railroad, and if the Erie proper were alone to be considered, this would be a favorable route for it; but it must be remembered that the Erie now includes the New York, Pennsylvania & Ohio road, that the two get a haul of 717 out of the 986 miles from New York to Chicago by the route *via* Marion and the Chicago & Atlantic road, while by the Nickel Plate route it gets but 423 out of 946 miles; also that the contract with the New York, Pennsylvania & Ohio requires that the larger part of the Erie's traffic to the West shall go by that road, as is plainly for its interest so long as it has to pay rent for that railroad.

Practical union of the Erie and the New York Central does not mean as much now as it would have done a few years ago. Then it would have concentrated the railroad traffic between New York and Buffalo. Now, in spite of the New York Central's acquisition of the West Shore, it leaves one independent road, the Lackawanna. The latter's western connections, it is true, do not give it anything like the power over western traffic that the Erie has long possessed, but it nevertheless is in position to command a considerable traffic, and especially to exercise considerable power over traffic and rates *via* Buffalo.

Another report is, that in some way not easy to understand the Pennsylvania Railroad Company is to have control of the Reading. The difficulties in the way of purchasing a controlling interest in this company are similar, but even greater than in the case of the Erie. It has a capital so enormous and the securities representing it are so numerous and some of them so unlikely to return an income that it is not easy to see how control could be purchased without a very large investment which would not be likely to make any direct return. The Pennsylvania can ill afford to make any such investments. It is already burdened heavily by investments made for control which result in a loss, and it has long carefully avoided everything of the kind. But both it and the Reading can certainly do better if they work together than if they are in conflict, as they often are, and if both roads were under one general control both ought to do better than they have done separately. When this is so it is always possible that some kind of union may be made. As it does not now appear at all certain who will exercise control over the Reading hereafter, there being a prospect of a foreclosure by which certain issues of bonds may succeed to the powers of ownership which the stockholders now nominally have, it would seem extraordinarily difficult to make any arrangement between the two companies now.

While the control of the Reading would still be a good thing for the Pennsylvania, it would have been a better thing if it could have been secured a few years ago, as then it would have saved the great expenditure which the Pennsylvania has made to reach the Schuylkill Valley by lines of its own.

Some newspapers have spoken of the possible transfer in control of the Reading as intended mainly to keep the Baltimore & Ohio out of New York. There is, however, not the slightest indication that any one has any idea of keeping the Baltimore & Ohio out of New York, and the managers of the great trunk lines must know it to be impossible. There is a ludicrous disproportion between the object to be attained and the means of attaining it. The Reading, with a capital of some $140,000,000, controls 59 miles of the line from Philadelphia to New York, while the other 31 miles are owned by the Central of New Jersey, whose capital is more than $56,000,000. It is not easy to believe that any sane people will risk millions for the control of nearly 200 millions of capital for the sake not of using, but of preventing the use of 90 miles of railroad, especially when the way is open for any one to build a new railroad over this 90 miles. Somehow the building of a parallel line of a hundred miles or less is looked upon as a tremendous undertaking in the East, while lines of much greater extent in the West scarcely attract any attention. A new road from Philadelphia to New York would be a good deal like the Wisconsin Central's new line now under way from Milwaukee to Chicago. It is very difficult to get a terminus in Jersey City, and so it is to get into the city of Chicago. There are, however, railroads with termini in Jersey City which could spare the Baltimore & Ohio room for its business, and some of them probably would do so. If the Reading falls under the control of the Pennsylvania in any way, it is altogether probable that the Baltimore & Ohio will have an opportunity to do its New York business either over it or over the Pennsylvania itself on terms which will be cheaper than building a new railroad across New Jersey, because in that way the Pennsylvania could make something out of that business.

Although it is extremely difficult to see how actual control of the Reading can be secured for the Pennsylvania or any other company, there are some indications that something of the kind—something which will insure the co-operation of the two roads—is counted on. The Pennsylvania is the natural western connection of the Reading and the interchanges between the two must be very large in spite of themselves. The Reading coal shipments westward may be diverted to another line, and they are quite important (though but a small fraction of its total coal shipments), and there is a considerable other traffic which the Reading can divert from the Pennsylvania to some other trunk line. The more valuable traffic which they would naturally interchange is within the state of Pennsylvania, and most of this cannot easily be diverted without a new railroad, like what the South Pennsylvania was to be.

Another rumor is that the western connections of the New York Central are to be put under the legal control of the latter. As things now are, the only thing which gives the New York Central any greater control over the Lake Shore, the Michigan Central or the Cleveland, Columbus, Cincinnati & Indianapolis than the Erie or the Lackawanna has, for instance, is the fact that a single family of great capitalists have very large holdings in each. It is always possible for this family to part with its holdings in one of these companies and then to make a new combination with another. We may imagine what would have been the fate of the New York Central if the Vanderbilts had sold their interest in that company and bought control of the West Shore, and then transferred the traffic of their lines west of Buffalo to the West Shore. It is true that it would have been extremely difficult for them to sell their immense holdings secretly, and knowledge of it would bring down the price so as to make it unprofitable; but we cannot count on a continuance of this state of things. In course of time the holdings, which are now concentrated in a single family of a few members who act generally as a unit, are likely to be divided among numerous members of the same family who may not preserve their holdings or always act together. Then a change in control might occur between two days, and "the Vanderbilt system" be broken up. Actually the New York Central Railroad Company has much less legal control over connections west of Buffalo than the Erie, and no more than the Lackawanna. It is hinted that this control may be provided through a corporation like the "Pennsylvania Company," which shall lease the lines west of Buffalo, and whose capital stock shall be owned by the New York Central. The chief value of such an arrangement, probably, would be security for the future. At present there is sufficient unity, because the managements of all the roads have been virtually appointed by one man; and if all the advantages of unity have not been secured, it has been chiefly because he has not willed it.

With regard to these and other rumors it is perhaps well to remember that this is a time when they are manufactured. Many people are engaged in "booming" stocks, and find the disposition of the public favorable. A rumor of something to be done which will be of great advantage to a company, if skillfully circulated and followed by a little manipulation of the market, will often result in a considerable advance in prices. This makes a demand for rumors, and the manufacture of them is usually sufficient to supply the demand.

## THE REJECTED STANDARD BRAKE SHOES.

The recently announced vote of the Master Car-Builders' Association, on the question of adopting the Christie or Collin brake-shoe as a standard, by which both of them were voted down, probably surprised no one, unless it may be those who expected that not only would both proposed standards lack a two-thirds majority, but that there would be many members who would vote no to each instead of simply making a selection between them. It would appear as if very few unqualified negatives of this kind were cast from the following summary of the vote (which was taken on one ballet):

| | Christie | P. c. | Collin. | P. c. | Total. |
|---|---|---|---|---|---|
| For..... ..... | 269 | 62¼ | 130 | 34⅔ | 399 |
| Against ..... ... | 163 | 37¾ | 245 | 65⅓ | 408 |
| | 432 | 100 | 375 | 100 | 807 |

A two-thirds majority being required for the adoption of a standard, it will be seen that the Christie barely failed (by 19 votes) of adoption, while the Collin had but a very small vote, and, in fact, appears to have received but very few more votes than are cast by the Pennsylvania interest alone (some 90 votes) if the latter, as would be but natural, were all cast for it.

It will be seen that there were 33 more votes cast *against* the Christie than *in favor* of the Collin, which would imply that number of votes against both, while there were 24 votes more *for* the Christie than *against* the Collin, which would imply that that number of votes voted "yes" to one proposition only, without voting "no" to the other. This would require that the total number of ballots cast should be 432, which is a large vote, but not altogether unprecedented.

The details as to how the failure to make a selection

came about, however, are less important than the lesson which it teaches. A more important practical question is: Supposing that one of the two proposed plans had been selected, would it have brought about conformity thereto, within a reasonable period, say ten or twelve years? Experience so far, with other standards, seems to indicate clearly that it would not, for even those standards which involve no question of mechanical principle, like the height of draw-bars from the rail or running-board and brake-shaft details, do not seem readily to meet general acceptance. In brake-shoes, however, we have a detail in which there is abundant room for difference of opinion and even for the development of better designs than any now in use. Is it to be wondered at that many were unwilling to pin their faith to one design only, with so much reason to fear that, even if their selection were really the best, it would not bring about the end desired?

It is always easier to determine after the fact the cause of any admitted result, than to determine in advance what is the proper course to pursue for attaining a desired end. Considering the matter in this light, it seems probable that in attempting to establish a single universal standard for a detail of this kind, where absolute uniformity is not a plain necessity, the Association is making a mistake in two ways: 1. It is attempting the impossible, which is always a foolish thing to do; and, 2, it is attempting what is intrinsically undesirable to do in attempting to bring about a final decision now which there might possibly be reason hereafter to regret. The question, therefore, naturally arises whether it cannot accomplish all the important ends it seeks in a little different way.

The argument for considering this possibility is strengthened by the fact that the difficulties with the brake-shoe standards referred to above are not altogether new. It is not unfrequently felt and stated that much of the difficulty in adopting and (still more) securing the use of several standards has arisen from attempting too much—more than was really essential for the immediate end in view—and it must be admitted that there is much to support this view.

The great difficulty at which all this adoption of standards is aimed is that there are dozens, and even hundreds, of different "standards," differing from each other so much that they are not at all interchangeable, but not differing enough to make any mechanical difference. After a man has endured this nuisance as long as he can, it is natural enough for him to say: "Come, let us have done with this nonsense and have only one standard for the whole country." This, as we say, is natural, but unless it can be made effective without injury, it is not particularly wise. The true end which is sought in establishing standards, and which should, therefore, be kept before the mind, is not to produce uniformity, *but to eliminate confusion.* To do this it is not at all necessary to reduce a hundred standards to only one. It is all-sufficient if we reduce a hundred standards to two or three or four.

An example will prove the truth of the distinction drawn better than words, and at the same time convey useful information. We find in an English exchange data (not always easy to obtain) from which we compile the following table, showing the dimensions of the standard axles on eight leading English lines:

LEADING DIMENSIONS OF ENGLISH STANDARD AXLES.

| | Size of journal. | | |
|---|---|---|---|
| | Live load per axle. | | |
| | 5 tons. | 4 tons. | 3 tons. |
| 1. London & Northwestern | 8 × 3¾ | 7 × 3½ | 6 × 3 |
| 2. Midland | 8 × 3¾ | 7 × 3½ | 6 × 3 |
| 3. Great Western | 8 × 3¾ | 7 × 3½ | 6 × 3 |
| 4. Northeastern | ..... | (8 × 3½) | ..... |
| 5. Great Eastern | 8 × 3¾ | 7 × 3½ | ..... |
| 6. Taff Vale | 8 × 3¾ | 7 × 3½ | ..... |
| 7. North Staffordshire | 8 × 3¾ | (7 × 3½) | 6 × 3 |
| 8. Lancashire & Yorkshire | 8 × 3¾ | 7 × 3½ | 6 × 3 |
| Normal type | 8 × 3¾ | 7 × 3½ | 6 × 3 |

| | Centre to centre of journals. | | |
|---|---|---|---|
| | Live load per axle. | | |
| | 5 tons. | 4 tons. | 3 tons. |
| | Ft. in. | Ft. in. | Ft. in. |
| 1. | 6 4 | (6 3) | (6 3) |
| 2. | ..... | ..... | ..... |
| 3. | ..... | ..... | ..... |
| 4. | ..... | ..... | ..... |
| 5. | ..... | ..... | ..... |
| 6. | 6 4 | 6 4 | ..... |
| 7. | ..... | ..... | ..... |
| 8. | 6 4 | (6 3) | ..... |
| Normal type | 6 ft. 4 in. | | |

| | Diameter at back of hub. | | |
|---|---|---|---|
| | Live load per axle. | | |
| | 5 tons. | 4 tons. | 3 tons. |
| 1. | (5¼) | (5) | 4⅛ |
| 2. | 5⅜ | 5⅛ | (4⅝) |
| 3. | 5⅜ | 5⅛ | (4⅝) |
| 4. | ..... | ..... | ..... |
| 5. | (5¼) | 5⅛ | ..... |
| 6. | 5⅜ | 5⅛ | ..... |
| 7. | ..... | ..... | ..... |
| 8. | 5⅜ | 5⅛ | (4⅝) |
| Normal type | 5⅜ | 5⅛ | 4½ |

| | Diameter through hub. | | |
|---|---|---|---|
| | Live load per axle. | | |
| | 5 tons. | 4 tons. | 3 tons. |
| 1. | 5¼ | 5 | 4⅛ |
| 2. | 5¼ | 5 | (4¼) |
| 3. | 5¼ | 5 | (4¼) |
| 4. | ..... | 5 | ..... |
| 5. | (5) | 5 | ..... |
| 6. | 5¼ | 5 | ..... |
| 7. | (5¼) | (4¾) | 4⅛ |
| 8. | 5¼ | 5 | 4⅛ |
| Normal type | 5¼ | 5 | 4⅛ |

| | Diameter at centre. | | |
|---|---|---|---|
| | Live load per axle. | | |
| | 5 tons. | 4 tons. | 3 tons. |
| 1. | (4¼) | (4) | 3¾ |
| 2. | 4⅛ | 4¼ | 3¾ |
| 3. | 4⅛ | 4¼ | 3¾ |
| 4. | ..... | (4⅛) | ..... |
| 5. | (4⅛) | (4⅛) | ..... |
| 6. | 4⅛ | (4⅛) | ..... |
| 7. | 4⅛ | 4¼ | (4) |
| 8. | 4⅛ | (4) | 3¾ |
| Normal type | 4⅛ | 4¼ | 3¾ |

It will be seen at a glance that the English are very far indeed from having a single "standard axle," but on looking closer it will also be seen that the differences are of two very distinct kinds:

1. *Arbitrary* or unmeaning differences, for the existence of which no discernible reason exists. These we have indicated by inclosing them in (parentheses).

2. *Functional* differences, or differences for which some good mechanical reason is supposed to exist. In this case it is the difference in the duty thrown upon them. With brake-shoes it may be partly this and partly doubts as to what is really the best type mechanically.

These differences are those which still exist in the dimensions which we have added below each table and entitled the "normal type."

Now we shall not discuss at all the mechanical merits of these typical axles—which in some of their details, as notably in having a shoulder back of the wheel-seat, seem open to no little criticism—neither shall we enter into the very large question, whether it is better to have but one established standard axle, as in this country, or three, as the tendency is in England, for that also is apart from our subject. We will simply ask this question:

Under the existing situation *in England*, who would be doing the most to bring about practical uniformity—he who should propose to adopt a single standard which appearances indicate that only a few would use, the rest retaining all sorts of variations therefrom as before, or he who should propose to adopt three or even four standards, with the plain prospect that some one of them will meet every man's requirements, whether real or fancied, and so afford reasonable certainty that all will be ready to use one or the other?

The answer, in view of the showing above, is hardly doubtful, and the situation in this country as respects brake-shoes is very much the same as in England as respects axles. In both cases there are (1) slight and unmeaning differences in the same general design, and (2) radical differences of design resting, or supposed to rest (much the same thing as respects inducing men to change), on good mechanical reasons. In each case a *complete* abandonment of the variations of practice involves the giving up of sincerely held convictions as to what is best, and not merely of diversity which is plainly foolishness. Does not experience indicate that men will not make such changes against their better judgment, and is there any sufficient reason for attemping the hopeless task of forcing them to do so, when the reduction of a hundred "standards" to two or three or four accomplishes the desired end almost as effectually as if they were all reduced to one? There are certain things, of course, as for instance screw-threads and the height of draw-bars, which do not admit of any variation if there is to be a standard at all; but there are others, as axles, trucks and notably brake-shoes, in which, if there are only *a few* kinds and those all interchangeable with their own kind, every important end contemplated in the adoption of standards has been met.

We suggest therefore whether it would not be at least more practical, if not more intrinsically wise, for the Association to abandon further effort to get all to agree on a single brake-shoe, and adopt instead something like the following resolution, which would insure on the one hand that the wishes of every considerable interest should be met and their coöperation secured in bringing about uniformity if not identity of practice, while on the other that there should be absolute interchangeability in whatever purported to be a standard:

Any brake-shoe and head which shall be certified, as hereinbelow provided, to be in use as the standard for not less than (50,000) cars, may be submitted to this Association at any annual convention with request that it be declared a standard of the Association, and unless rejected as mechanically imperfect for reasons stated by a majority vote of the members present or of the Executive Committee, both of which shall vote upon the question, it shall be declared a standard.

Any such request, to be effective, must be accompanied by a full-sized brass model of the proposed standard brake-shoe and head, and must be signed by members entitled to cast not less than (50) votes. For the purposes of this resolution each vote shall be considered to represent 1,000 cars.

When any brake-shoe and head has been so declared a standard of the Association, it shall be the duty of the Executive Committee to cause exact patterns to be prepared from the model so submitted, and to furnish the same to all applicants at a fixed and reasonable price. An engraving to reduced scale shall likewise be prepared and included thereafter in the list of standards of the Association.

After any standard has been so established, it is the sense of the Association that patterns for use in its manufacture should thereafter be obtained exclusively from the Executive Committee or its authorized agents, and should not be manufactured by individual lines.

Such a resolution, it may reasonably be expected, would not result in the adoption of more than three or four standards at most, at least not for some years, and keeping a stock of so many for interchange purposes (on roads which needed all) would not be a very great burden, while it would afford reasonable certainty that every standard which was adopted should be a real standard, practically interchangeable with others of its kind, avoiding those minor deviations—intentional and unintentional—which are apt to be more annoying when they exist than considerable differences, because wholly unmeaning.

We offer the suggestion with some diffidence, but as the Association seems to have done about all that can be done toward securing *identity* of practice, without effect, might it not be well for it to try some plan which has at least more prospect of success, even if (what we are not prepared to admit) it is less intrinsically desirable?

## Preparations for the Trunk Line Pool.

The deliberations of the trunk lines over the plans for maintaining rates continue. With regard to passenger business they are substantially completed for the time—that is, the plan designed by Vice-Chairman Pierson and the passenger men has been approved by the Trunk Line Executive Committee and will be recommended by it to the trunk line presidents for adoption. It is understood that it provides for a division of gross earnings on the eastern trunk lines only on substantially the whole west-bound travel to all competitive points on their western connections, with a recommendation that later a similar division of the east-bound business be made. The arrangement for differences in rates by different lines is an elastic one: that is, whenever a route has not been able to secure the share of the business allotted to it by arbitration, it will be entitled to a differential to secure it such a share. Questions as to divisions, etc., are to be left to the arbitration of Mr. Fink, without appeal, and some regulations are provided to prevent great delay in determining such questions, and Mr. Fink's office will have some sort of audit of the passenger business divided. The claim of the Baltimore & Ohio to be recognized as a New York line seems somewhat premature, but it is probably only a question of a few months when it will be able to be actually in New York without asking the consent of any trunk line, and its action at this time may enable it to determine now by what means it shall get there. The question probably will be settled between it and the Pennsylvania Railroad Company, and there are no fears expressed of a failure on this score.

The plan so far made will be but a beginning. Not only is the east-bound travel left to be provided for hereafter, but a division of business among the western connections of the trunk lines, which has always been felt necessary to any permanent harmony. But all difficulties cannot be provided for at once, and it is thought best to leave many questions to be settled as they arise. An organization of this kind is not likely to be strong and healthy, unless it is a growth more than a creation; but if there is harmony in purpose, as there seems to be now, there should be little difficulty in the way of the extension of the scheme to cover all points necessary.

So far the work has been confined to the trunk lines whose coöperation is an indispensable preliminary to any combination further west, because they by their own lines control the western lines over which the great bulk of the traffic passes. With regard to freight as well as passengers, there is likely to be a money pool—a payment of balances from a fund deposited with the Commissioner for that purpose. This, it must be confessed, does not always secure the object aimed at. It is not generally known that through the past season of cut rates the live stock and dressed beef pool has been maintained, while the rates were not by any means maintained; and certain lines have taken month after month more than their share of the traffic at less than the pool rates, and paid over balances month after month at the full pool rates, actually paying out money for the privilege of carrying traffic.

To secure the maintenance of rates west of the trunk line termini, it is proposed to hold the trunk lines themselves responsible for them. They not absolutely control their principal connections, but it is felt that they better than an organization dealing indirectly with them can compel the connections which they do not directly control to maintain rates.

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By carrying for less than cost the New York railroads succeeded in getting a larger traffic in grain and flour to New York last September than the year before, while the total New York receipts were about the same both years. But the increase by the railroads was insignificant in consideration of the rates at which it was carried. The totals for the month are in bushels (grain and flour):

| | 1885. | 1884. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| By rail | 9,142,366 | 7,516,138 | + 1,626 228 | 21.6 |
| By water | 5,715,085 | 7,064,782 | — 1,349,687 | 19.1 |
| Total | 14,857,451 | 14,580,920 | + 276,531 | 1.9 |

The *gross* earnings of the railroads from this busi-

ness were certainly two-fifths less this year on their large business than last year on the smaller one.

The notable features in September were the very small share brought by the Lackawanna and the very large one brought by the West Shore. The latter never before carried so much in a single month, but the Lackawanna carried more in every month from June of last year till May of this. The West Shore's increase is noticeable because it was at a time when the business was done at a loss, and this road apparently no longer had anything to gain by cultivating a business or injuring a rival. The receipts by it for the last six months have been, in bushels:

| April. | May. | June. | July. | Aug. | Sept. |
|---|---|---|---|---|---|
| 1,301,575 | 906,016 | 779,663 | 474,749 | 412,343 | 1,433,581 |

The total rail shipments increased from 7,024,000 bushels in August to 9,142,000 in September, so that about one-half of the entire increase of 2,118,000 bushels was by the West Shore. It gained 1,021,000 bushels from August to September, while the New York Central gained but 201,000; the Erie, 587,000; the Pennsylvania, 137,000; and the Lackawanna, 178,000.

The deliveries at New York by the several routes in September for three years have been:

| | 1885. | 1884. | 1883. | 1882. | 1881. |
|---|---|---|---|---|---|
| N. Y. Cen.. | 3,261,875 | 2,505,521 | 2,802 6.7 | 4 241,167 | 4,707,945 |
| Erie..... | 2,541,661 | 2 139,651 | 3,9?7,942 | 2,602,441 | 3,069,229 |
| Penna..... | 1,478,913 | 1,473,750 | 1,587,148 | 1,850,993 | 1,729,343 |
| Lack ... .. | 388,998 | 545,628 | 562,184 | ..... | .... ..... |
| W Shore.. | 1,433.581 | 851,586 | 33,586 | 19,414 | 12,984 |
| Other..... | 37,335 | | | | |
| Tot'l rail. | 9.14 ,366 | 7,516,138 | 8,913,487 | 8,714,015 | 9,519,501 |
| Coastwise.. | 375,049 | 282,582 | 316 331 | 157,238 | 5,474,498 |
| Canal..... | 5,340,036 | 6,802,200 | 7,482,60 | 3,571,200 | |
| Total.... | 14,857,451 | 14,580,920 | 16,712,418 | 12,442,453 | 14,993,991 |

Compared with last year there is a gain of 1,626,000 bushels in the total rail receipts, of which 756,000 was by the Central, 619,000 by the West Shore, 402,000 by the Erie, and 5,000 by the Pennsylvania, while there was a decrease of 157,000 by the Lackawanna. The Erie has a very large loss since 1883, when it carried an extraordinarily large share—40 per cent. more than the New York Central.

The canal movement, it will be noticed, was larger this year than in 1882, and not much less than in 1881, when a railroad war was waging, but 28 per cent. less than in 1883 and 21½ per cent. less than last year. That in spite of the extremely low rail rates 36 per cent. of the entire receipts at New York should have been by canal seems remarkable. Excluding flour, which is not shipped at all by canal, only 55 per cent. of the receipts were by rail last September, 42.8 per cent. coming by canal and 2.2 by coasting vessels. It may thus be considered established that a 10-cent rail rate from Chicago to New York will not prevent canal shipments. Apparently, such a rate is lower than any canal rate ever quoted, but we see that, notwithstanding, the canal brought nearly as much grain (excluding flour) to New York as all four of the railroads between Buffalo and New York (5,340,000 bushels, against 5,801,000).

The difficulty of prescribing any tests which shall be perfectly fair to all is illustrated by the proposed regulations for a competitive trial of freight train brakes to be made under the auspices of the Master Car-Builders' committee on that subject. The committee's programme requires that fifty 20-ton cars fitted with the proposed brake on both trucks shall be delivered to the Chicago, Burlington & Quincy Railroad for a trial on Dec. 7. The cars will then be put into general service on that road for five months (the brake patentees and not the railroad being responsible for mileage), when, in May, 1886, they will be called in and, without being prepared for trial, the December tests repeated.

The objection to this programme has already been made to us, and certainly is a real one so far as it goes, that, if put into general service, "receiving only ordinary repairs," buffer brakes will be working, and hence wearing out, in every stop that each car makes, while air brakes will not be working at all unless kept in a train by themselves and hauled by locomotives fitted for air brakes.

More earnest complaints have already reached us with reference to the proviso that "no brakes will be allowed on the engine, and hand brakes only on the tank." It is claimed that buffer brakes have not a fair chance if this regulation, as worded, is strictly adhered to, since their efficiency depends in part or whole on an efficient brake at the *head* of the train, the efficiency of the latter measuring, more or less, the efficiency of the whole. As committees of the Association have on at least three occasions (1877, 1878, 1879) reported in favor of the use of power brakes on both engine and tender, and as every brake system now in use recommends and uses, so far as we know, engine brakes, the purpose of the prohibition is not clear. If, however, it contemplates merely the use of *the same* engine brake in tests of all the car brakes submitted, so that the comparative efficiency of the latter may be determined quite apart from the irrelevant question of the comparative merits of different engine brakes at the head of the train, a reason for prohibiting the submission of engine brakes as well as car brakes for trial is at once evident, and a very good reason it is. Whether it is the true one or not, we are not informed.

The controversy in the English technical journals in respect to the merits and demerits of compounding for locomotives, to which we referred in our issue of Oct. 16, still rages actively, and has extended to the *Engineer* as well as *Engineering*. The chief stress of the argument against compounding is laid on the difficulty in starting, but the general tenor of the discussion seems to be against them. The strong point of the argument in favor of compounding—beside the general and wide-spread favor which the plan has obtained among intelligent mechanical engineers of various countries—is the argument by analogy from the success of the plan in marine engines in spite of an opposition very similar to that which is now displayed in respect to locomotives; but the conditions of the problem are so very different in these two types of engines, that there is hardly even a *prima facie* probability that what succeeds with one will succeed with the other. It is like the precisely similar argument drawn from the absence of slack in passenger trains, which was opposed as dangerous, to prove that opposition to eliminating slack from freight trains is equally mistaken. In both cases the reasoning is superficially strong, but really weak, because of the very different conditions.

Nevertheless, in both cases, the conclusion thus reached may be right, although the reasons for it are wrong, and there seems more probability of this in the case of compound engines than in the case of slack for freight trains. The question, at any rate, bids fair to be thoroughly investigated in Europe by men who have now strong reasons to see that the innovation has at least fair play, and we see no reason why, in the present stage of the controversy, American roads should likewise experiment upon it, unless in the case of a design having such considerable features of novelty as to promise to avoid the leading difficulties which have so far developed abroad. That of getting power for starting, on which most stress seems to be laid, ought not to be insuperable, and it may well be that all the designs now running will fail, while some newer and slightly modified design will prove a great success. Theoretically the compounding of locomotives ought to succeed. Practically it seems more doubtful.

## September Accidents.

Our record of train accidents in September, given on another page, contains brief notes of 40 collisions, 47 derailments and 4 other accidents; a total of 91 accidents, in which 25 persons were killed and 98 injured.

Eight collisions, 8 derailments and 1 other accident caused the death of one or more persons; 9 collisions, 12 derailments and 2 other accidents caused injury but not death. In all, 17 accidents caused death and 23 lesser injuries, leaving 51, or 56 per cent. of the whole number, in which there was no injury serious enough for record.

The 40 collisions caused 12 deaths and 28 injuries; the 47 derailments killed 12 persons and injured 68, while in the 4 other accidents 1 person was killed and 2 hurt.

Seventeen of the persons killed and 50 of those injured were railroad employés, who thus made up 68 per cent. of the killed, 51 per cent. of the injured and 54½ per cent. of the whole number of casualties.

As compared with September, 1884, there was a decrease of 9 accidents, an increase of 3 killed, and a decrease of 76 persons injured.

These accidents are classed as to their nature and causes, as follows:

| | | |
|---|---|---|
| COLLISIONS: | | |
| Rear | | 30 |
| Butting | | 8 |
| Crossing | | 2 |
| | | — 40 |
| DERAILMENTS: | | |
| Broken rail | 7 | |
| Broken frog | 1 | |
| Broken switch-rod | 2 | |
| Broken bridge | 4 | |
| Spreading of rails | 5 | |
| Broken wheel | 3 | |
| Broken axle | 4 | |
| Broken truck | 1 | |
| Broken brake-beam | 1 | |
| Accidental obstruction | 1 | |
| Cattle on track | 3 | |
| Wash-out | 1 | |
| Misplaced switch | 4 | |
| Purposely misplaced switch | 1 | |
| Malicious obstruction | 3 | |
| Unexplained | 6 | |
| | | — 47 |
| OTHER ACCIDENTS: | | |
| Broken parallel-rod | 2 | |
| Explosion of oil tank | 1 | |
| Explosion of acid in freight car | 1 | |
| | | — 4 |
| Total | | 91 |

Five collisions were caused by trains breaking in two; three by misplaced switches; two by fog; two by the derailment of preceding trains; two by misunderstanding of orders, and one by a car blown out of a siding.

A general classification of these accidents may be made as follows:

| | Collisions. | Derailments. | Other. | Total. |
|---|---|---|---|---|
| Defects of road | .. | 19 | .. | 19 |
| Defects of equipment | 5 | 9 | 2 | 16 |
| Negligence in operating | 30 | 4 | .. | 34 |
| Unforeseen obstructions | 5 | 5 | 2 | 12 |
| Maliciously caused | .. | 4 | . | 4 |
| Unexplained | .. | 6 | .. | 6 |
| Total | 40 | 47 | 4 | 91 |

Negligence in operating is thus charged with 37 per cent. of all the accidents, defects of road with 21 and defects of equipment with 17½ per cent.

A division by classes of trains and accidents is as follows:

| *Accidents:* | Collisions. | Derailments. | Other. | Total. |
|---|---|---|---|---|
| To passenger trains | 2 | 18 | 2 | 22 |
| To a pass. and a freight | 7 | .. | .. | 7 |
| To freight trains | 31 | 29 | 2 | 62 |
| Total | 40 | 47 | 4 | 91 |

This shows accidents to a total of 131 trains, of which 31 (23½ per cent.) were passenger trains, and 100 (76½ per cent.) were freight trains.

Of the total number of accidents 52 are recorded as happening in daylight and 39 at night.

The total number of accidents in the first, second and third quarters of this and last years, with the number of broken rails were as follows:

| | 1885. | | | 1884. | | |
|---|---|---|---|---|---|---|
| | Total. | Bro. rails. | P. c. | Total. | Bro. rails. | P. c. |
| First quarter.. | 447 | 67 | 15.0 | 372 | 38 | 10.2 |
| Second quarter | 218 | 8 | 3.6 | 245 | 3 | 1.3 |
| Third quarter. | 259 | 8 | 3.1 | 278 | 3 | 1.1 |

This table again illustrates in a striking way the effect of the weather upon the number of train accidents, and upon the proportion of them due to the breaking of rails.

For the year ending with September the record is as follows:

| | Accidents. | Killed. | Injured. |
|---|---|---|---|
| October | 105 | 39 | 170 |
| November | 96 | 47 | 130 |
| December | 105 | 24 | 109 |
| January | 145 | 24 | 182 |
| February | 216 | 44 | 259 |
| March | 86 | 17 | 84 |
| April | 81 | 14 | 75 |
| May | 62 | 8 | 65 |
| June | 75 | 24 | 115 |
| July | 76 | 28 | 75 |
| August | 92 | 37 | 172 |
| September | 91 | 25 | 98 |
| Total | 1,230 | 331 | 1,534 |
| Total, same months, 1883-84 | 1,293 | 388 | 1,933 |
| " " " 1882-83 | 1,641 | 476 | 1,801 |
| " " " 1881-82 | 1,332 | 385 | 1,467 |

The monthly average for the year was 103 accidents, 28 killed and 128 injured. The yearly average for the four years was 1,374 accidents, 395 killed and 1,684 injured.

The averages per day for the month were 3.03 accidents, 0.83 killed and 3.27 injured; for the year they were 3.37 accidents, 0.91 killed and 4.20 injured.

The average casualties per accident were, for the month, 0.275 killed and 1.077 injured; for the year they were 0.269 killed and 1.245 injured.

Both September and the year thus make by comparison quite a favorable showing.

## Pennsylvania Railroad Earnings in September.

The Pennsylvania Railroad earnings in September were much more favorable than in any previous month of this year, which, it must be remembered, is in spite of the fact that rates on the through freight were then at their lowest.

The decrease in gross earnings of the lines east of Pittsburgh and Erie was less than in any other month of the year except June, and the decrease in expenses was a little larger than that in gross earnings, so that for the first time in the year there was an increase in net earnings. But the most encouraging fact is that earnings were $320,000 (8 per cent.) greater than in August, while in every other year since 1879 the August earnings have been the larger.

For thirteen successive years the gross and net earnings and expenses of lines east of Pittsburgh and Erie in the month of September have been:

*Pennsylvania Railroad Earnings and Expenses in September.*

| Year. | Gross earnings. | Expenses. | Net earnings. |
|---|---|---|---|
| 1873 | $4.039.196 | $2.195,006 | $1,784.100 |
| 1874 | 3.252,228 | 2,039,810 | 212,418 |
| 1875 | 3.571.057 | 1,807,504 | 1,673.553 |
| 1876 | 3.860.904 | 1,649.320 | 2.220,674 |
| 1877 | 3.006,408 | 1,471,691 | 1,534,717 |
| 1878 | 2.858,646 | 1.456,451 | 1,402.195 |
| 1879 | 3.3 6,529 | 1,745,891 | 1,590,638 |
| 1880 | 3,647,543 | 2,172,634 | 1,474,909 |
| 1881 | 3,735 006 | 2,271,829 | 1,463,177 |
| 1882 | 4 417,602 | 2.683,176 | 1,734.426 |
| 1883 | 4,634 990 | 2,712.6 5 | 1,922.364 |
| 1884 | 4.458,871 | 2,571,557 | 1,887,314 |
| 1885 | 4,276,628 | 2,384,658 | 1,891,970 |

Thus this year the gross earnings and working expenses were the smallest since 1881, but the net earnings were *larger* than in any previous September except in 1883-and 1876 (Centennial travel). This is chiefly due to the large decrease in expenses. Heretofore there has been, compared with most other railroads, but little decrease of expenses on this road.

Compared with last year, and with 1883 (when earnings were largest), the changes are:

| Since | Gross earn. | Expenses. | Net earn. |
|---|---|---|---|
| 1884 | Dec. $182,243 | Dec. $186,899 | Inc. $4,656 |
| Per cent | 4.1 | 7.3 | 0.3 |
| 1883 | Dec. 358,371 | 327,977 | Dec. 30,394 |
| Per cent | 7.7 | 12.1 | 1.6 |

Meanwhile the lines *west* of Pittsburgh and Erie have not done so well, their surplus or deficit in meeting all obligations in September having been :

| | | | | | |
|---|---|---|---|---|---|
| 1879 | Surplus, | $345,688 | 1883 | Surplus, | $321,789 |
| 1880 | " | 222,018 | 1884 | " | 50,632 |
| 1881 | " | 214.113 | 1885 | Deficit, | 100,604 |
| 1882 | " | 445,870 | | | |

Thus while there was an increase of $4,656 in the net earnings of the eastern system, there was a decrease of $151,236 in the income of the western system, and the income from both systems was :

| | | | |
|---|---|---|---|
| 1879 | $1,936,326 | 1883 | $2,244,153 |
| 1880 | 1,696,927 | 1884 | 1,937.916 |
| 1881 | 1,677,290 | 1885 | 1,791,366 |
| 1882 | 2,180,296 | | |

Thus the income from the two systems in September was less this year than in any other since 1878, except 1880 and 1881.

The loss of the western system was less in September than in any other month since April.

For the nine months ending with September the gross and net earnings and working expenses of the lines east of Pittsburgh and Erie for nine successive years have been :

*Pennsylvania Railroad Earnings and Expenses for Nine Months.*

| Year. | Gross earnings. | Expenses. | Net earnings. |
|---|---|---|---|
| 1877 | $22,006.256 | $14,088,741 | $7.917,515 |
| 1878 | 22,819,918 | 13,534,111 | 9,285,807 |
| 1879 | 24,516 214 | 14,823,106 | 9,693.108 |
| 1880 | 30,253,617 | 17,827,312 | 12.426,305 |
| 1881 | 32,878.246 | 19,482.436 | 13,395,810 |
| 1882 | 35.887,786 | 22,283,280 | 13,604,506 |
| 1883 | 37,892,916 | 23,816.364 | 14.076,552 |
| 1884 | 36,398,108 | 22,855,843 | 13.549.265 |
| 1885 | 33,236,640 | 22,015,664 | 11,220,976 |

Thus, the gross earnings and expenses this year were the smallest since 1881, and the net earnings the smallest since 1879. Compared with last year and 1883 (when earnings and expenses were largest), the decreases are :

| Since. | Gross earn. | Expenses. | Net earn. |
|---|---|---|---|
| 1884 | $3,161,468 | $840,179 | $2,321,289 |
| Per cent | 8.7 | 3.7 | 17.1 |
| 1883 | 4,656,276 | 1,800,700 | 2,855,576 |
| Per cent | 12.3 | 7.6 | 20.3 |

Thus two-thirds of the decrease of gross earnings and four-fifths of the decrease of net earnings since 1883 occurred this year.

For these nine months the surplus or deficit of the lines *west* of Pittsburgh and Erie has been :

| | | | | | |
|---|---|---|---|---|---|
| 1879 | Surplus | $108,834 | 1883 | Surplus | $894,318 |
| 1880 | " | 2,096,565 | 1884 | Deficit | 661,859 |
| 1881 | " | 2,208,783 | 1885 | " | 1,287,918 |
| 1882 | " | 1,067,772 | | | |

Thus the loss on this system is nearly twice as great as last year, and the decrease in the profits of this system is about one-fourth as great as the decrease in the net earnings of the eastern system. Since 1881 there has been a decrease of $3,556,701 in the profits of this western system for the nint months, by itself equal to a dividend of 3¾ per cent. on the Pennsylvania Railroad stock.

Adding this surplus of the system to and subtracting the deficits from the net earnings of the system east of Pittsburgh, we have as the income from both systems:

| | | | |
|---|---|---|---|
| 1879 | $9,801,942 | 1883 | $14,970.870 |
| 1880 | 14,522,870 | 1884 | 12 880,406 |
| 1881 | 15,664 593 | 1885 | 9,933,058 |
| 1882 | 14,672 278 | | |

Thus the income this year is the smallest since 1879. The decrease from last year is $2,847,348, or about 3 per cent. on the present capital stock, and the decrease from 1881 is $5,731,535, which is 7.4 per cent. on the capital stock then outstanding. The improvement in September, which will probably continue the rest of the year, was therefore very badly needed.

The articles on the terminal facilities of the New York railroads, by Mr. Gratz Mordecai, which have been published in the *Railroad Gazette* during the past year, have been collected by the author in a volume of 68 large octavo pages and six folding plates, the latter containing some engraving, which have not heretofore been published, and including especially a very useful and interesting map of New York, with the shore lines of Jersey City and Brooklyn, on which the railroad terminal grounds, docks, and stations are colored red the district occupied by the wholesale trade in manufactures is colored blue, in food, yellow, and markets and storehouses, black. Information on this subject has been exceedingly difficult to obtain in print, and this publication ought to be valuable to many.

Chicago through shipments eastward for the week ending Oct. 24, including flour, grain and provisions this year and last, and freight of all kinds (except live stock) in previous years, have been, in tons :

| 1880. | 1881. | 1882. | 1883. | 1884. | 1885. |
|---|---|---|---|---|---|
| 44,200 | 62,295 | 34,041 | 44,083 | 39,068 | 25,179 |

Thus the shipments, allowing for any possible shipments of higher class freight, were much less this year than in any other and 36 per cent. less than last year.

The shipments for each of the last six weeks and the percentage of the total going by each railroad have been:

| | Week ending. | | | | | |
|---|---|---|---|---|---|---|
| | Sept. 19. | Sept. 26. | Oct. 3. | Oct. 10. | Oct. 17. | Oct. 24. |
| *Tons :* | | | | | | |
| Flour | 4,990 | 5.054 | 6.052 | 10.359 | 6,952 | 4,412 |
| Grain | 35,308 | 40,634 | 44,776 | 36,288 | 27,157 | 14,628 |
| Provisions | 11,863 | 9,669 | 11,591 | 8,813 | 4,681 | 6,139 |
| Total | 52,161 | 54,757 | 62,419 | 55,460 | 38,790 | 25,179 |
| *Per cent. :* | | | | | | |
| C. & Grand T. | 6.9 | 16.3 | 16.5 | 7.2 | 2.9 | 9.3 |
| Mich. Cen | 25.3 | 24.8 | 23.3 | 23.0 | 32 5 | 17.7 |
| Lake Shore | 19.7 | 16.2 | 18.0 | 20.5 | 18.1 | 13.4 |
| Nickel Plate | 8.8 | 10.0 | 12.6 | 10.8 | 5 5 | 7.4 |
| Ft. Wayne | 15.6 | 12.9 | 11.2 | 17.9 | 21.6 | 29.2 |
| C., St. L. & P | 12.5 | 7 9 | 7 7 | 10.3 | 10.0 | 12 0 |
| Balt. & Ohio | 5.2 | 6.9 | 7.7 | 7.1 | 4.9 | 6.0 |
| Ch. & Atlantic | 6.0 | 5.0 | 3.0 | 3.2 | 4.5 | 5.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Thus the total shipments last week were 35 per cent. less than the week before and 55 per cent. less than two weeks before. They were the smallest since the middle of August last, and probably the smallest made in any fall week since 1879 at least. The decrease, however, was an entirely natural one. Notice that the extremely low rates of 10 or 12 cents per 100 lbs. would give place to a 20-cent rate was made early enough to permit the hurrying forward of exceptionally large amounts, which left less than the normal amount to be shipped after rates had been actually advanced. This is shown sufficiently by the exceptionally large shipments of the five weeks ending Oct. 10, which, in spite of an exceptionally light total grain movement, amounted to 310,958 tons, against 207,931 last year, 222,346 in 1883 and 173,165 in 1882. A large part of the increase this year was certainly due to a diversion of traffic from the lake vessels, but a part also was simply anticipated. A similar change occurred after the advanced rates in July of last year, the shipments falling off in two weeks from 59,364 to 25,234 tons. A recovery may be expected after the first week or two, but there is not the least probability that the railroads will carry nearly as much at 20 as at 10 cents per 100 lbs.

The decrease since the week of largest shipments has been 60 per cent.; but in flour the decrease was but 27 per cent., and in provisions 47 per cent., while in grain it was 70 per cent. This also is the natural course. The grain at this season is diverted to the lake vessels, but not much of the flour and still less of the provisions, the rail shipments of which will probably soon be up to the average again.

The percentages changed greatly last week, there being great gains by the Fort Wayne and the Chicago & Grand Trunk and great losses by the Michigan Central and the Lake Shore, compared with the previous week. The three Vanderbilt roads together carried 38.5 per cent. of the whole and the two Pennsylvania roads 41.2 per cent. last week, against 56.1 and 31.6 the week before. The very large falling off in the grain movement had much to do with this, the chief grain carriers suffering the great decreases in proportions. But the Fort Wayne last week was the great grain carrier, taking more than any other two roads, which is altogether unusual.

As nearly as can be learned, the 20-cent rate was well maintained last week, and there was some profit in the business, which has not been the case before for a long time.

The breadstuffs exports in September last were unusually light, as for several months previous. The total of all grains, with flour, reduced to bushels, and the value in September for five years have been :

| | 1881. | 1882. | 1883. | 1884. | 1885. |
|---|---|---|---|---|---|
| Bushels | 17,552,730 | 21,986,773 | 16,800,432 | 15,382,208 | 12,392,602 |
| Value | $19,947,433 | $24,062,601 | $16,192,960 | $13,651,358 | $9,067,7.0 |

Thus both quantities and values are very much less this year than in any other of the five—less than in any year since 1876 probably. Compared with last year, there is a decrease of nearly one-fourth in quantity and of more than one-third in value. That the average value is so small this year is due not only to low prices, but to a larger proportion than usual of low-priced grain; thus last year of the total 15,332,000 bushels, no less than 13,026,000 (85 per cent.) were wheat and flour; this year they form only 6,316,000 bushels (51 per cent.) of the total 12,392,000. *Oats* form a considerable part (15¾ per cent.) of the exports this year, which is very unusual.

For the three months ending with September the values of the breadstuffs exports have been:

| 1881. | 1882. | 1883. | 1884. | 1885. |
|---|---|---|---|---|
| $65,471,721 | $70,081,590 | $45,281,501 | $42,522,156 | $25,499,571 |

The decrease from last year is 40 per cent., and from 1882, when the value was greatest, it is 63⅜ per cent.—a very serious change.

The provision exports in September show a large increase in pork products, and a decrease in all items of beef products except salt beef, in which, however, the increase is very large (162 per cent.), and there is a large decrease in butter and a small one in cheese. The exports of pork products in September have been, for nine years, in *millions* of pounds :

| 1877. | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. | 1884. | 1885 |
|---|---|---|---|---|---|---|---|---|
| 56.0 | 51.7 | 56 9 | 86.2 | 63.3 | 43.2 | 57.3 | 42 2 | 64 8 |

Thus, only in 1880 were the September exports larger than this year, and the increase over last year is no less than 53½ per cent.

For the nine months ending with September the exports have been, in millions of pounds :

| 1877. | 1878. | 1879. | 1880. | 1881. | 1882 | 1883. | 1884. | 1885 |
|---|---|---|---|---|---|---|---|---|
| 539.2 | 839 9 | 888.6 | 978.5 | 708.4 | 502.9 | 581.9 | 439.8 | 587.2 |

Thus the exports this year were 33½ per cent. more than last year, a little more than in 1883, and 17 per cent. more than in 1882, but much less than in any of the four years previous, and 40 per cent. less than in 1880, when they were greatest.

The values of the exports of provisions and dairy products in September and the nine months ending with September, for five years, have been :

| | 1881. | 1882. | 1883. | 1884 | 1885. |
|---|---|---|---|---|---|
| September | $9,695,218 | $7,453,784 | $8,660,431 | $7,509,246 | $7,784,600 |
| Nine months | 102 803,051 | 73,375,969 | 86,118,648 | 70,456,521 | 72,020,006 |

The figures for this year for the nine months are 13¼ per cent. less than in 1883 and 30 per cent. less than in 1881, which was the last year of the very large exports of pork products.

There is reason to expect that the latter will for a year to come be larger than before since 1881, though probably not so large as then.

The New York shipments to the West were less in October than in September (as usual), but they were, in the first half of the month, somewhat larger this year than last or any previous year except 1881 and 1882.

The Northwestern wheat receipts were larger in the week to Oct, 17 than in any previous week of this year, and a fourth more than in any other week since harvest. There are gains everywhere, but chiefly at the spring-wheat markets, reckoning Chicago as one. There and at Milwaukee the receipts were larger than they have been before, but that is true also of Detroit. Duluth received more than any other market, but only a little more than Chicago. These and Milwaukee together received 1,464,625 bushels; St. Louis, Toledo and Detroit, 1,037,202 bushels. The total wheat receipts, though so much larger than heretofore this year, were nearly one-third less than in the corresponding week of last year. They were, however, a fifth more than in 1883.

On the other hand, the wheat receipts of the Atlantic ports were decidedly *smaller* in this week to Oct. 17 than in any previous week since harvest, and not one-third as great as the Northwestern receipts. Since July the Northwestern receipts and the Atlantic receipts have been, in bushels :

| | Receipts. | | | Receipts. | |
|---|---|---|---|---|---|
| Week to— | Northwest. | Atlantic. | Week to— | Northwest. | Atlantic. |
| Aug. 1 | 1,379.572 | 1,221,798 | Sept. 12 | 2,023,983 | 1,293.093 |
| " 8 | 1,246,486 | 1,045,985 | " 19 | 1.794.370 | 1,462,331 |
| " 15 | 2.045.412 | 1,334,340 | " 26 | 1,808,913 | 1,067,848 |
| " 22 | 1.748,958 | 1,321.780 | Oct. 3 | 1.907,149 | 1,168,526 |
| " 29 | 1,573,675 | 1,013,882 | " 10 | 2,045,198 | 1,103,655 |
| Sept. 5 | 1,839 333 | 1,623,008 | " 17 | 2,566 662 | 790.940 |
| 6 weeks | 9,833,436 | 8,460,793 | 6 weeks | 12,146.275 | 6,886,793 |

Thus in the first six weeks the Atlantic receipts were not far (1,573,000 bushels) behind the Northwestern receipts, but in the last six weeks the latter have been much the greater (5,260,000 bushels). At all times a large part of the whole movement is to places in the interior of the East, and much of the Atlantic receipts (and of this last named consumption) comes from the states south of the lakes and east of the Mississippi, when they have much wheat to spare. The indications now are that they have very little to spare, and that what they have has been mostly marketed. This leaves it to the Northwest and to Michigan to supply nearly the whole demand, to do which requires that they send less to the seaboard for export. Minnesota, Dakota and Michigan wheat is going to mills in Illinois, Ohio, Pennsylvania and New York to fill the place of what would have gone from Kansas, Illinois, Indiana and Ohio, but for the short crop.

This is favorable to the more northern railroads, because most of these shipments must go over their lines.

The advance in rail rates seems to have made but little difference in the total shipments of grain from the Northwestern markets, but it has made a great deal of difference with the rail shipments, and in the week to Oct. 17 for the first time in six weeks, lake shipments were larger (yet only a trifle larger) than the rail shipments. For these six weeks the shipments had been :

| Week to | By rail. | By river. | By lake. | P. c. by rail. | Total. |
|---|---|---|---|---|---|
| Sept. 19 | 3,141,863 | 89,863 | 2,294,472 | 57.0 | 5,526 288 |
| " 19 | 2.958,544 | 10,223 | 2.584,563 | 53.3 | 5.553,330 |
| " 26 | 3.313,335 | 54.922 | 1,964.277 | 62.1 | 5,332,534 |
| Oct. 3 | 3,719,953 | 124.514 | 2,026.266 | 63.5 | 5 861,733 |
| " 10 | 3.041,909 | 176,767 | 1,890,884 | 59 5 | 5,109.560 |
| " 17 | 2,414,951 | 321,286 | 2,446,785 | 46.0 | 5,253,022 |

Thus the total shipments in the last week when, we may assume, that the shipments were nearly all at the higher rate, were slightly greater than the week before (the rail shipments 627,000 bushels less and the lake shipments 556,000 greater). Since the week to Oct. 3, when the rail shipments were all at very low rates, and shippers were making haste to take advantage of them, the total shipments have fallen off but 608,700 bushels, but the decrease in rail shipments has been 1,305,000 bushels, there being an increase of 420,500 bushels in lake shipments, and of 266,700 in Mississippi River shipments, which latter were very much larger than in any previous week since early spring.

The vast territory between the Pacific coast and the Mississippi River is nearly destitute of timber in quantities great enough to supply even the very thin population of the plains and the mining country. On the line of the Northern Pacific the great pine forests extend much further west than further south, considerable pine lumber being cut west of the Mississippi and north of the line of that road, not far east of the west line of Minnesota. On the Pacific end of the line there are immense forests, but they extend only a short distance inland, and east of the Cascades the country is treeless. There is, however, a considerable tract of timber in the mountains not far from Pend d'Oreille Lake. Heretofore, Dakota has received its supplies from the east—from the pine woods of Minnesota and Wisconsin; the lumber of Puget Sound has supplied Washington and Oregon, and the mining districts of Montana and Idaho have received from the Pend d'Oreille country what the scattering growths near by would not supply. The Puget Sound district is the only one needing new markets, the country east of Montana being likely to require all that Wisconsin and Minnesota can supply; but heretofore we do not hear that any Puget Sound lumber has crossed the Rocky Mountains. Now, however, it is said that a new Northern Pacific tariff makes it possible for the Pacific coast mills to compete for the supply of Montana. It will be interesting to see how far east it can go—where the line will be between the Wisconsin and the Pacific lumber.

The bids recently put in (five in number) for removing 30,000 tons or 15,000 cubic yards of the broken fragments of the Flood Rock explosion range from $6.38 to $7.80 per cubic yard, against $4.58 to $6 for similar work on the Hallett's Point explosion in 1876, when the average prices for such work are claimed to have been some 50 per cent. higher than now. This, the *Engineering and Mining Journal* claims, is only confirmatory evidence of the otherwise "more than probable" fact that the rock is not as well broken up as at Hallett's Point, whereas experience indicated that it was

desirable to have it more broken up. The same journal gives details of the comparative cost of the two works, which cause it "no little disappointment," as indicating no progress in economy. As they indicate, however, that the total cost per cubic yard up to the time of and including the explosion was only some $12 to $13 per cubic yard removed, we fail to see the reason for its disappointment, even if the dredging does prove considerably more costly. It would appear as if the *Engineering and Mining Journal* had been comparing the wrong figures with each other. Assuming that the average cost of dredging will be $7, and taking the approximate statements of $1,000,000 expenditure to the date of the explosion, and 300,000 cubic yards of dredging, the two works compare as below:

| | Hallett's Point. | | | Flood Rock. | | |
|---|---|---|---|---|---|---|
| | Cost | | | Cost | | |
| | Cu. yd. | Total. | Per. yd. | Cu. yds. | Total. | Per yds. |
| Excavated.. | 47,461 | $952,106 | $20.06 | 80,166 | ($1,000,000) | $12.45 |
| Dredged .... | 45,294 | 249,910 | 5·52 | (300,000) | ( 2,100,000) | 7.00 |
| Total .. .. | 92,755 | $1,202,016 | $12 96 | 380,166 | $3,100,000 | $8.15 |

In view of the fact that the contract price for the new aqueduct tunnel is $6.46 per yard, where the work is done of course under much more favorable circumstances in many ways, the total cannot be considered high.

The great excess of danger to special over regular trains is illustrated by a report made this week of accidents which have happened during the past season to the three special trains which transport Forepaugh's circus about the country. During that limited but indefinite period, *six* serious collisions or derailments have happened to these trains, or two apiece.

Circus trains of this kind are usually estimated by passenger agents to run about 50 miles per day, any excess over that mileage causing an extra charge. At this rate these three circus trains should have traveled during the past season (which is the less dangerous part of the year) something like 27,000 miles, or 4,500 miles per serious train accident. Now, the total passenger mileage of the United States has probably been for the past year something over 216,000,000 miles, and at the same rate there should be 48,000 *serious train accidents per year to passenger trains only* in the United States. Really there are certainly somewhat less than 1,000, or say one-fiftieth part as many (and probably still less) happening to *all* trains with passenger and freight, of which one-third only are to passenger trains; for our accident report, which includes many far less serious accidents than these, ranges from 900 to 1,300 per year only.

Of course, this may be, and doubtless has been an unusually disastrous season for the circus in the way of accidents; but at the same time the experience of three trains zigzagging about all over the country for an entire season as they do should give a pretty fair sample of operating contingencies for that class of trains, and making a very large discount from the total above deduced to bring it to figures more fairly representing the average chances of several seasons together, it must still remain true—what is abundantly indicated by almost every one of our monthly accident summaries—that special trains of this kind are peculiarly subject to train accidents; a fact which, if it were more forcibly realized, might have no little tendency to diminish the danger. It is clear that, for railroad purposes, the old proverb, "It is the unexpected which always happens," might profitably be enlarged into "It is the unexpected train that something always happens to," and pasted up in large letters in every dispatcher's office.

The Executive Committee of the Master Car-Builders' Association has finally fixed the construction to be placed on the new interchange prices for wheels and axles, as was noted in our last issue, and have confirmed the view we have taken from the first that "'constructive' turning like 'constructive' mileage has its objectionable side," ruling that the charge shall only be made when a new axle is used, which must, of course, be turned. Otherwise the committee assume that the wheel will, or should be assumed to be, always bored to fit the axle and not the axle turned to fit the wheel.

Several correspondents have controverted this view, and we suspect that a majority of the roads have heretofore agreed with them in their practice, perhaps with the sensible idea of making sure that they charged as much as they were charged.

The committee also submit a new form of bill which they authorize the use of, saying that they shall recommend it for adoption at the next revision. The form submitted has the appearance of being unnecessarily awkward. It is the same as the old form, except that it substitutes for the former two columns, "no wheels and axles used" and "new or second hand" no less than ten columns, three of which are for the three small labor items, "boring and fitting," "drawing and replacing" and "turning axle," these items being always, when charged at all, 50 cents, 50 cents and 40 cents. Surely the mental tax for checking these charges would not be too great if they were all put in one sum in one column, and that would then leave room to remedy what ought to be felt as a great defect in the form, that it affords no protection against the placing of the most inferior wheels on cars at the authorized price of $11 each (which is the market price of a strictly first-class wheel) when they need repairs on foreign roads. It is notorious that some roads buy one quality of wheels for their own use and another to put on foreign cars, justifying themselves by the excuse that "they give as good as they get," and there now exists no effective check against this practice, nor would it seem that there can be any except to require—what the plainest business prudence requires—that no man's goods should be paid for "unsight unseen," as the children say, without requiring him to indicate in some way on the face of his bill whether he is furnishing the article which the price charged is supposed to command, or inferior articles with which the market is flooded, largely for this very purpose.

An extraordinary English engineering work is described in a London letter to the *Sanitary Engineer;* nothing less than the excavation of a cut half a mile long, 30 ft. (and something over) deep and 240 ft. wide on top, containing 1,500,000 cubic yards of earth, and costing complete $750,000 for use in—torpedo practice! The ditch is to be puddled and kept full of water to a depth of 30 ft. controlled by lock gates. The contract is stated to call for its completion within five months, and the amount of earth to be moved is enough for grading from 75 to 150 miles of ordinary American railroad work. We have observed no mention of this work in English engineering papers.

### Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

*Asheville & Spartanburg.*—Track laid from Asheville, N. C., southward 8 miles.

*Baltimore & Ohio.*—Track on the *Philadelphia Branch* is extended from the Delaware state line north to Chester, Pa., 7 miles.

*California Southern.*—Extended from the Mohave River, Cal., south 10 miles; also on the south end north to the Cajon Pass, 14 miles.

*Chicago, Burlington & Quincy.*—The *Oberlin Branch* is extended southwest to Oberlin, Kan., 37 miles.

*Chicago & Northwestern.*—Track laid on the *Northern Illinois Branch* from Belvidere, Ill., south to Troy Grove, 64 miles.

*Cincinnati, Van Wert & Michigan.*—Extended from Tecumseh, O., south to West Manchester, 7 miles.

*Denver, Utah & Pacific.*—Extended from Longmont, Cal., to Lyons, 11 miles.

*Houston, East & West Texas.*—Extended southwest to Logansport, La., 8 miles.

*Jacksonville, Tampa & Key West.*—Extended from Satsuma, Fla., southward to Crescent Lake, 17 miles.

*Kansas City, Clinton & Springfield.*—Track laid from Ash Grove, Mo., north to Vista, 53 miles; also from Deepwater, Mo., south to Osceola, 14 miles.

*Kansas & Gulf Short Line.*—Extended southward to Lufkin, Tex., 10 miles.

This is a total of 260 miles on 11 lines, making 2,130 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years has been:

| | Miles. | | Miles. |
|---|---|---|---|
| 1885 | 2,130 | 1878 | 1,724 |
| 1884 | 3,030 | 1877 | 1,824 |
| 1883 | 5,188 | 1876 | 1,913 |
| 1882 | 8,446 | 1875 | 1,080 |
| 1881 | 5,763 | 1874 | 1,524 |
| 1880 | 4,614 | 1873 | 3,130 |
| 1879 | 2,859 | 1872 | 6,106 |

These figures include *main track only*, second tracks and sidings not being counted.

### The Winter Programme of the Master Car-Builders' Club.

At a meeting of the Master Car-Builders' Club, held in New York, Oct. 15, the following programme for the monthly meetings of the Club through the winter was decided upon.

*November meeting.*—Rules of Interchange.

*December meeting.*—Car Wheels and the Fitting of the same to Axles.

*January meeting.*—The Subjects to be Discussed at the next Annual Meeting of the Master Car-Builders' Association.

*February meeting.*—Repairs of Cars by Contract.

*March meeting.*—Questions to be submitted for discussion, 15 minutes to be allowed for discussion on each question.

*April meeting.*—The subject to be named hereafter.

The meetings will be held, as heretofore, on the evenings of the third Thursday in each month, at the rooms, No. 113 Liberty street, in New York city.

## Contributions.

### The Quick Switching on the Denver & Rio Grande.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In regard to the *fancy switching* done at Pueblo, on the Denver & Rio Grande Railway, on the morning of Sept. 4, which has been going the rounds of the newspapers, and I see recorded in your issue of Oct. 16, it may be wrong to ask any foolish questions which might have a tendency to spoil a good story, but I am curious to know how Conductor Wilds could register "out" before Conductor Harrison could register "in;" how was "seal record" taken, car inspection made, etc., etc.

Please note that this train had just dropped down an elevation of a little over a mile, 11 miles of which was a straight 4 per cent. grade, at a rate evidently of 25 to 35 miles per hour.

This story seems to me to either have a "fishy" taint, or else an *acrobatic* performance has been indulged in, which no railroad man could feel proud of, and which would discharge every man concerned from the service of any well-managed railway in America. QUESTION.

## THE SCRAP HEAP.

### A Crank's Engine.

An exchange states that the following letter was recently received by a firm of engineers:

"*To Messrs. X. & Co.:*

"Sir i would like if assisted by some one to invent an engine to work without any expence at all and after it is or before it is approved of i would like to dispose of it. Sir the engine will work without steam air or any other pour that is now in go and when it is once erected expence is done unless repairs or tender sir if you want to bring to light the same said engine you can do so on any reasonable offer and reaceve every satisfaction. "Z."

### Vaccinating Railroad Men.

Maine is near enough to Montreal to make the people there somewhat afraid of the small-pox epidemic now prevailing in that city. Railroad men are naturally peculiarly exposed to the contagion from their occupation, which necessarily brings them in contact with travelers of all classes. The Maine Central Co. has, therefore, ordered all its employés to be vaccinated, and Dr. Young, of Augusta, the Secretary of the State Board of Health, last week passed over the road, stopping wherever necessary and vaccinating over 400 employés of the road.

### Discouraging a Young Man.

"Say!" he whispered, as he suddenly turned to a young man sitting beside him in a Broadway car, "don't waste your time on me. That's a memorandum book you've been trying to get hold of for the last five minutes, and this watch isn't worth five dollars."

"Sir?"

"Say, take my advice. I want to see you get along and do well—really I do—and if I were you I'd rob a bank or go through a train. It's just as handy, you know, and there's something in it."

The young man looked completely discouraged as he got off the car.—*North American.*

### Clearing Out a Hermit.

In a description of the new bridge of the Jacksonville, Tampa & Key West road over the St. Johns River at Buffalo Bluff, Fla., the Jacksonville *Times* says:

"Buffalo Bluff is a long tongue of land, a peninsula in fact, extending out into the river, owned and occupied by an erratic old gentleman named McGraw. He is a man of peculiar views of life, and in politics declares himself to be a locofoco. He voted several times for Old Hickory for President, and when he learned by accident of the old hero's death he plunged at once into the wilds of Florida and found a hermitage on this long neck of land.

"It was with horror, therefore, that he found this remote and almost inaccessible refuge was to be split in twain, cloven down the chine, as it were, by a hermit's supremest abomination, a railroad. He went to law about it, but Civilization was marching in the van of the contractors, and Solitude packed her grip-sack and emigrated from Buffalo Bluff."

### Dinner Trains.

The Fitchburg Railroad is now trying an experiment to meet a want that has been felt for a long time. Passenger trains will be run daily, Sundays excepted, for the accommodation of those who desire to eat their dinners at home. This experiment was begun Monday, the outward train leaving Boston at 12:07, and stopping at Charleston, Union Square, Somerville, Cambridge and Brick Yards. The return train leaves Brick Yards at 12:40, and arrives in Boston at 12:55.—*Boston Advertiser.*

Such a service is, of course, possible only for short distances and in a community where people take time to eat their dinners. It would be entirely out of the question around New York.

### A Singular Accident.

The Boston *Evening Record* of Oct. 26 says: "News has been received of a terrible accident near Oakdale, in Worcester County, on the Central Massachusetts road, in which nine men were seriously injured. It appears that for some time past a gang of Italians have been at work on the gravel pits near Oakdale. On Saturday evening, when the gravel train returned from the pit to Cambridge, a number of cars were left on a siding near the Oakdale station. This morning the gravel train with its gang of men left Boston at 20 minutes to 5 o'clock. The Italians are unable to speak a word of English, but through their interpreter they have been repeatedly warned not to sit on the side of the car. But, in spite of this caution, as well as the commands of the interpreter, they assumed their favorite position this morning as usual. As the train approached Oakdale it was found that some boys, while playing in the cars that had been left on the siding, had moved them so that the forward car came very near the main line. The engineer of the gravel train noticed the proximity of the cars, but saw that there was plenty of room for his train to clear, and as he was running slowly, did not stop. The result was that, while there was plenty of space for the cars, there was not sufficient room for the legs of the unfortunate Italians who were seated with their feet hanging over on that side of the train. Nine men were swept off the cars and all sustained serious injuries, some having both legs broken, and nearly all receiving compound fractures. Surgeons were immediately summoned and the injured men sent back to Boston, arriving there between 10 and 11 o'clock. One of the Italians, whose name is not known, died on the way. The other eight were taken to the Massachusetts General Hospital, where they were all doing well at 3 o'clock. No blame is attached to the road, for the conductor and brakemen on this train have done their best to keep the Italians away from the sides of the cars. The train was only running at 8 miles an hour at the time of the accident, or the result would have been far more serious."

### Remarkable Case of Nervous Prostration.

An esteemed daily contemporary is responsible for the following narrative, but the names seem to be a little mixed:

A few days ago it was reported throughout the country that Mr. Brooks, of Sheffield, Lost Car Agent of the Nantucket road, and one of the best known railroad men in New Mexico, was missing, and that he had eloped with a woman from Wyoming, leaving his wife and children without warning. To-day Mr. Brooks was found in a quiet Alabama town by a correspondent of a Coney Island paper. After saying that he intended to return to his home and his wife to-morrow, he told the following story: "I went to Pike's Peak to transact business for my road, and until about noon was very busy there. About that time I met a party of friends and accepted an invitation to dine. Wine was partaken of perhaps rather freely. After dinner I started for the Richmond & Danville station, and boarded the train for Fishkill, intending to go direct to that point. From that time until two days ago I have but an indistinct realization of what occurred. I realized soon after dinner that the wine was having a strange effect; which soon rendered me oblivious of my surroundings. This I can only account for through the fact that for some time I have been aware that I was suffering from nervous prostration, the result of a multiplicity of duties during the past summer.

"I remember getting out of the Pere Marquette train for

a moment, and I got back, as I supposed, upon the same train, but to my surprise found that I was in Sacramento when the train stopped. At Vicksburg I remember sending word to the lady who has been mentioned in connection with my departure to meet me on board the "Puritan." So far as my domestic affairs are concerned, that is a matter that the public has no interest in, and on that score I have nothing to say. In all candor I admit pursuing an unwise course, and can only expect that time and my future conduct will efface from public view the conspicuous position which I now occupy."

Mr. Brooks, says the correspondent, is evidently suffering from nervous prostration.

The moral of this remarkable history appears to be threefold:

First. Dont go to Pike's Peak on business.

Second. Avoid Nervous Prostration.

Third. If you must have it, take plenty of passes in your clothes, so that you can distribute yourself around the whole United States without inconvenience.

☞ The Nantucket road possesses one push car and a new man officiates as Lost Car Agent.

# General Railroad News.

## MEETINGS AND ANNOUNCEMENTS.

### Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*East Tennessee, Virginia & Georgia*, annual meeting, in Knoxville, Tenn., Nov. 11.

*Manhattan*, annual meeting, at the office in New York, Nov. 11.

*Memphis & Charleston*, annual meeting, in Memphis, Tenn., Nov. 12.

*New York, Lake Erie & Western*, annual meeting, at the office in New York, Nov. 24.

### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Cincinnati, Hamilton & Dayton*, 3 per cent., semi-annual, payable Nov. 1.

*Pacific Mail Steamship Co.*, 1¼ per cent., quarterly, payable Nov. 2, to stockholders of record on Oct. 24.

### Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be as follows:

The *American Society of Mechanical Engineers* will hold its annual meeting at the Hotel Brunswick in Boston, beginning on Tuesday, Nov. 10.

The *Central Club of Car Accountants* will hold its next meeting in Columbus, O., on Wednesday, Nov. 18.

The *Eastern Division of the Car Accountants' Association* will hold a quarterly meeting in Philadelphia, on Thursday, Nov. 19.

### Foreclosure Sales.

The *St. Louis, Hannibal & Keokuk* road will be sold at public sale on Dec. 8 next, at the Custom House in St. Louis, by B. Gratz Brown, Special Master under a decree of foreclosure and sale granted by the United States Circuit Court. The sale will include the road from Hannibal, Mo., to Gilmore, 81¾ miles, with all the equipments, franchise, etc. The purchaser will be required to pay $35,000 in cash to the Master at the time of sale, and the balance when the sale is confirmed by the court. No bid will be received for less than $370,000.

The *Ohio Central, River Division*, extending from Corning, Ohio, to Charleston, was sold in Charleston, W. Va., Oct. 22, to Erwin Davis, Albert Gallup and Ed. C. Homans, trustees for the bondholders, for $600,000. Land belonging to the company, 10,600 acres, was purchased for $8,000. The bridge across the Ohio River was sold at Parkersburg on Oct. 15, under a decree of the United States Circuit Court, to pay liens for construction. The price of the bridge was $200,000. One million dollars in stock and $1,000,000 in bonds on the bridge were sold for $5,000, but this stock and bonds merely represent the balance remaining after paying liens in the Parkersburg suit, that surplus being $5,000. The latter purchase was made by Erwin Davis and John W. Simpson, who are a committee for the bondholders.

### Mail Service Extension.

Mail service has been ordered over the new *Minnesota & Northwestern* road, from Mona, Ia., to St. Paul, Minn., 110½ miles.

### Order of Railway Conductors.

The Order of Railway Conductors held its annual convention in Louisville, Ky., Oct. 21. The Order was reported in a flourishing condition. The usual routine business was transacted, and a motion to extend the limits of membership was voted down. It was resolved to make Chicago the permanent headquarters of the organization.

### Brotherhood of Brakemen.

The second annual convention of the Brotherhood of Railroad Brakemen met last week at Burlington, Ia., with 200 delegates present from all parts of the United States. A public meeting was held, when an address of welcome was delivered by Mayor Adams, and ex-Gov. Gear and others spoke at length. The remaining proceedings were private.

### Brotherhood of Locomotive Engineers.

The annual session of the Brotherhood of Locomotive Engineers began in New Orleans, Oct. 21, when a public meeting was held. About 300 delegates were present. The business sessions were held with closed doors, as usual, and the convention remained in session until Oct. 30.

### Train Dispatchers' Association.

The New England members of the American Train Dispatchers' Association held a meeting Oct. 27, in Boston, at the Eastern Division station of the Boston & Maine Railroad, and formed a local branch. E. A. Smith, Chief Dispatcher of the Fitchburg road, was elected President; E. L. Dodge, of the Boston & Lowell, Vice-President; H. M. Forristall, of the Boston & Maine, Secretary and Treasurer. Representatives from nearly all the New England roads were present. President Smith delivered an address. The meeting adjourned to Wednesday, Nov. 11.

## ELECTIONS AND APPOINTMENTS.

*American Street Railway Association.*—This association at its convention in St. Louis last week elected the following officers: President, Julius S. Walsh, of St. Louis; First Vice-President, William White, of New York; Second Vice-President, Charles B. Warner, of Chicago; Third Vice-President, Samuel L. Little, of Boston; Secretary and Treasurer, Wm. J. Richardson, of Brooklyn; Executive Committee, C. A. Richards, of Boston; John Kilgour, of Cincinnati; John Maguire, of Mobile, Thomas W. Ackley, of Philadelphia, and C. C. Woodworth, of Rochester. Next year's session will be held in Cincinnati.

*Atlantic & Pacific.*—N. A. Drake, Chief Engineer, and J. Moylan, Assistant Engineer, have resigned and their positions are abolished. F. E. Nelson is appointed Superintendent of Road Department. George F. Chalender, Assistant Superintendent of Motive Power and Machinery, has resigned, and his office is abolished. James G. McCuen is appointed Superintendent of Motive Power and Machinery.

*Beech Creek, Clearfield & Southwestern.*—The following circular is issued by the President, William A. Wallace: "Mr. H. A. Horning having resigned his position with this company, Mr F. E. Herriman is appointed General Freight and Passenger Agent, with office at Jersey Shore, Pa."

*Brotherhood of Locomotive Engineers.*—The Grand Division, in session in New Orleans, Oct. 24, elected the following officers: J. B. Sprague, of Toronto, Second Grand Chief Engineer; H. C. Hayes, of Detroit, First Grand Assistant Engineer; George H. Van Tassell, of New York, Third Grand Assistant Engineer; J. H. Fitzgerald, of Sedalia, Grand Guide; Deloss Everett, of Philadelphia, Grand Chaplain. Grand Chief Engineer Arthur and First Grand Chief Engineer Ingram, both of Cleveland, hold over.

*Central Massachusetts.*—At the annual meeting in Boston, Oct. 28, the following directors were chosen: Samuel N. Aldrich, Thomas H. Perkins, Henry Woods, Lyman Hollingsworth, J. Edwin Smith, William T. Parker, Moses W. Richardson, Elisha S. Converse, Samuel Atherton, William M. Gaylord, H. F. Hills. The following officers were subsequently elected: President, Samuel N. Aldrich; Clerk and Treasurer, George F. Seymour.

The following circular from General Superintendent C. S. Mellen is dated Boston, Oct. 19:

"The care of track, iron bridges and masonry for the same, culverts, and all expenses incident to the maintenance of way, is given in charge of the Chief Engineer, Mr. G. M. Tompson, from this date. The Roadmaster and all sectionmen will report to and receive their orders from him, subject only to the authority of this office."

*Champaign, Havana & Western.*—Mr. L. L. Fellows is appointed General Freight and Passenger Agent.

*Charlotte, Columbia & Augusta.*—Mr. E. B. Thomas is appointed General Manager, to date from Oct. 12.

*Chicago & Alton.*—Mr. W. H. Dody is appointed Traveling Auditor in place of H. Bennison, resigned.

*Chicago, Burlington & Northern.*—The directors of this company as consolidated are: John L. Gardner, Charles J. Payne, Alexander Cochrane, Alexander Touzalin, Boston; Augustus Hemenway, Canton, Mass.; W. Powell Mason, Walpole, N. H.; Edward C. Perkins, Milton, Mass.

*Cincinnati, Indianapolis, St. Louis & Chicago.*—At the annual meeting in Indianapolis, Oct. 27, the old directors were re-elected, with the exception of Mr. Henry Lewis, of Cincinnati, who was succeeded by Mr. E. T. Jeffery, of Chicago. Mr. Jeffery is General Superintendent of the Illinois Central road.

*Cincinnati, Washington & Baltimore.*—Mr. C. K. Lord has been appointed General Passenger Agent, in place of Thomas P. Barry, resigned. Mr. Lord is also General Passenger Agent of the Baltimore & Ohio.

*Columbia & Greenville.*—Mr. E. B. Thomas is appointed General Manager of this company.

*Columbus & Rome.*—At the annual meeting in Columbus, Ga., Oct. 20, the following officers were elected: President, John Peabody; directors, W. H. Brannon, W. R. Brown, S. J. Whiteside, W. L. Clark and A. F. Hill.

*Delaware & Hudson Canal Co.*—Mr. Theodore Voorhees having resigned the position of Superintendent of the Saratoga and Champlain divisions of this company, and the several divisions composing the Northern Railroad Department, viz.: Susquehanna, Utica, Saratoga and Champlain, having been consolidated, Mr. C. D. Hammond is appointed Superintendent, to take effect Nov. 1, with headquarters at Albany, N. Y.

Mr. A. J. Swift is appointed Chief Engineer of the Northern Railroad Department of this company, to take effect Nov. 1, with headquarters at Albany, N. Y. In all matters pertaining to the maintenance of way, the Chief Engineer will report to and receive orders from the Superintendent.

The office of Secretary of the Northern Railroad Department is abolished from Oct. 10. Mr. J. White Sprong is appointed Comptroller and Purchasing Agent of the Northern Railroad Department, taking effect from Oct. 10, with headquarters at Albany, N. Y. All reports, correspondence, etc., pertaining to business transacted under his former title will be addressed to him as heretofore.

*Evansville & Indianapolis.*—At the annual meeting in Evansville, Ind., Oct. 19, D. J. Mackey, Wm. Heilman, Edwin Taylor, S. M. Archer, E. P. Horton, E. E. Law and W. D. Ewing were elected directors. The directors re-elected Edwin Taylor President; W. D. Ewing, Secretary and Treasurer.

*Evansville, Jackson & New Orleans.*—At a meeting held in Evansville, Ind., Oct. 22, this company elected the following directors: W. F. Nesbitt, William Heilman, J. E. Williamson, Evansville; R. B. Radcliff, Princeton, Ky.; B. O. Enloe, Jackson, Tenn.; George M. Priest, James F. Clay, Henderson, Ky.; S. S. Brow, Pittsburgh; J. Giles, Arthur Carry, Louisville; Dr. P. G. Kelsey, De Koven, Ky. The directors elected P. G. Kelsey President and S. Giles Secretary and Treasurer.

*Evansville & Terre Haute.*—At the annual meeting in Evansville, Ind., Oct. 19, the following directors were chosen: D. J. Mackey, William Heilman, T. W. Cook, Evansville; James Stillman, F. W. Evans, J. W. Ellison, F. W. Foote, Herman Clark, Joseph M. Deverall, C. C. Baldwin, Benjamin Russak, New York city; Isaac T. Burr, Boston.

*Georgia Pacific.*—Mr. E. B. Thomas has been appointed General Manager of this company.

Mr. Peyton Randolph has been appointed Assistant General Manager of this company. His authority will be recognized by all officers and employés in all matters coming within the authority of the General Manager in the absence of that officer.

Mr. George S. Barnum is appointed General Freight and Passenger Agent in place of L. S. Brown, resigned.

*Houston, East & West Texas.*—Mr. Charles E. Perronell is appointed General Freight and Passenger Agent.

*Lake Shore & Michigan Southern.*—Mr. S. Chase is appointed Assistant General Freight Agent, vice Charles M. Gray, deceased, with office at Chicago, and will, under the direction of the General Freight Agent, have charge of eastbound freight business from Chicago, Englewood and South Chicago, and from connecting railways at Chicago.

*Michigan & Ohio.*—At the annual meeting in Toledo, O., Oct. 16, directors were re-elected as follows: Calvin S. Brice, Lima; Samuel Thomas, Columbus; W. H. Brown, Samuel Shethar, New York; John T. Martin, E. H. R. Lyman, Brooklyn; E. R. Cummings, W. B. Howard, Chicago; Dan. P. Eels, Cleveland; C. M. McGhee, Knoxville, Tenn.; George Ingersoll, Marshall, Michigan.

*Middle & Western States Railroad Association.*—In Louisville last week Horace F. Smith, of the Louisville & Nashville, was elected Secretary of the association, vice I. F. Martin, whose resignation was accepted.

*Napanee, Tamworth & Quebec.*—The officers of this company are: President, A. Henry; Vice-President, W. R. Aylsworth; General Manager, E. W. Rathbun; Secretary, W. S. Williams; Superintendent, H. B. Sherwood; Chief Engineer, W. J. Butler. Offices at Deseronto, Ontario.

*New England Train Dispatchers' Association.*—The officers of the New England Branch of the American Train Dispatchers' Association are: President, E. A. Smith, Fitchburg Railroad; Vice-President, E. L. Dodge, Boston & Lowell; Secretary and Treasurer, H. M. Forristall, Boston & Maine.

*New York Central & Hudson River.*—Mr. Thos. S. Faulkner is appointed Emigrant and Ticket Agent, at 5 Bowling Green and in Castle Garden, New York.

*Northeastern of Georgia.*—At the annual meeting in Athens, Ga., Oct. 21, the old board was re-elected, with the exception of Billups Phinizy, who was replaced by J. M. Orr.

*Order of Railway Conductors.*—In Louisville, Ky., Oct. 26, this association elected the following officers: Second Chief Conductor, Edward Coman; Grand Senior Conductor, W. J. Durbin; Grand Junior Conductor, W. W. W. Flack; Inside Sentinel, Charles W. Everts; Outside Sentinel, John H. Hall. E. H. Belknap was elected a member of the Executive Committee, and W. S. Sears of the Insurance Committee. The Convention will meet again the second Tuesday in May, 1887, at New Orleans.

*Pennsylvania, Slatington & New England.*—Mr. Wm. V. McCracken, recently appointed Receiver in New Jersey, has been appointed Receiver in Pennsylvania and New York also.

*Richmond & Danville.*—The following circular is the official announcement of an appointment already noted:

"Mr. E. B. Thomas has been appointed General Manager of this company, in place of Col. A. L. Rives, resigned. He will assume the duties of the position Oct. 12, 1885, and his acts and authority as such will be respected accordingly."

*St. Joseph & Rio Grande.*—The office of this new company is in St. Joseph, Mo.; the officers are A. M. Saxton, President; W. A. P. McDonald, Vice-President; S. A. Walker, Treasurer; Joseph Hansen, Secretary.

*St. Paul Eastern Grand Trunk.*—This company, whose road is leased to the Milwaukee, Lake Shore & Western Co., elected directors as follows, Oct. 20: W. H. Reese, New York; H. F. Whitcomb, A. L. Cary, J. O. Thayer, J. Donahue, A. S. Allibone, C. H. Ilsley, D. G. Hooker, Albert Conro, J. A. Hasbrouck, C. M. Cottrill, Milwaukee; William Elwell, Richard Ogden, Sheboygan.

*Sheffield Terminal.*—The directors are: Clarkson Jones, Toronto, Ont.; Philip Jones, Brockville, Ont.: Enoch Ensley, Memphis, Tenn.; W. B. Wood, Florence, Ala.; R. G. Hervey, Philip Campbell, Henry Habbeler, Sheffield, Alabama.

*Suburban Rapid Transit Co.*—The directors of this New York company are: Samuel R. Filley, President; D. B. Safford, Vice-President; E. D. Adams, J. J. Crane, G. S. Bowdoin, Gustav Schwab, C. T. Christensen, J. H. Wright and C. H. Coster. Mr. C. K. Smith is the Secretary, and Mr. J. J. R. Croes the Chief Engineer.

*Tennessee & Great Northern.*—The office is in Union City, Tenn.; the directors are George G. Bell, A. J. Lyon, F. L. Peck, Henry Rosendale, Wm. H. Shryock and Samuel Wad dell.

*Texas Trunk.*—The directors have elected the following officers: Jules Schneider, President; A. Sanger, Vice-President; J. L. Marsalis, Treasurer; J. E. Henderson, Secretary. Office in Dallas, Texas.

*Virginia Midland.*—Mr. E. B. Thomas has been appointed General Manager of this road, vice Col. A. L. Rives, resigned.

*Western North Carolina.*—Mr. E. B. Thomas has been appointed General Manager of this company in place of Col. A. L. Rives, resigned.

## PERSONAL.

—Mr. L. S. Brown has resigned his position as Genera Freight and Passenger Agent of the Georgia Pacific road.

—Clark W. T. Thompson, the builder of the Southern Minnesota, and at one time the largest contractor in the Northwest, died at Wells, Minn., Oct. 11, from the effects of a paralytic stroke.

—Mr. Edward W. McKenna, for 10 years past Superintendent of the Jeffersonville, Madison & Indianapolis road, has tendered his resignation of that office, to take effect Dec. 1 next.

—Mr. W. D. Gillett has resigned his position as Chief Assistant Engineer of the Central Pacific road to take the office of General Manager of the Pomona Land & Water Co., with quarters at Pomona, California.

—Hon. M. L. Hinman, Secretary and Treasurer of the Brooks Locomotive Works, and Mayor of the city of Dunkirk, N. Y., has been nominated for State Senator by the Democratic convention in his district.

—Mr. W. B. Parsons, Jr., has resigned his position as Roadmaster of the Susquehanna Division of the New York, Lake Erie & Western road, and has opened an office as Civil Engineer at No. 35 Broadway, New York.

—Gen. James H. Wilson, recently President of the New York & New England Railroad Co., sailed last week from San Francisco for Hong Kong. Gen. Wilson goes to China as the representative of Mr. Nathaniel McKay and associates, of Boston, with the expectation of securing some contracts for railroad construction in that country.

—Mr. C. L. Strobel, Consulting Engineer of the Keystone Bridge Co., has opened an office of this company in Chicago. In addition to his duties as agent and engineer of the company named, he will also design and take charge of the execution of other structural work as engineer, or give engineering advice in such matters.

—Gen. Zenas C. Priest was tendered a reception at Little Falls, N. Y., Tuesday evening, Oct. 20, in commemoration of 50 years' service for the New York Central Railroad. He was presented with an engrossed testimonial by the directors of the company, which speaks in flattering terms of the General's industry and faithfulness. The employés of the company in Little Falls presented him with a gold-mounted cane and umbrella.

—Mr. James Macfarlane died at Towanda, Pa., Oct. 12. He was born at Gettysburg in 1819, educated at Pennsylvania College, and went to Towanda in 1851 as surveyor on the North Branch Canal. He had numerous connections with railroad and coal interests, in the latter especially his scientific knowledge being most prominently displayed. He was the author of "The Coal Fields of America," a book of the very highest authority, and he prepared the article on coal in the American Encyclopædia. He also wrote the "Geological Railway Guide," which he was engaged in revising at the time of his death. Mr. Macfarlane was one of the original commissioners appointed by Governor Hartranft to perfect the geological survey of Pennsylvania, and continued a member until he died. He was arbitrator of the soft-coal combination. In 1880 he opened the Long Valley Mines, in Bradford County.

—The late Col. Thomas M. Peirce, President of the Galveston, Harrisburg & San Antonio Railroad, made the following public bequests in his will: To establish a charitable hospital on the line of the road in Texas, such a sum as his Trustees shall deem necessary, provided it does not exceed $20,000; to complete the church at Dover, N. H., in memory of his father and mother, a sum not exceeding $20,000; to the religious society connected with the above church, as a permanent fund, $10,000, the interest to be applied to the support of a library and public lectures; to the following-named towns lying along the line of his road as a permanent fund, the income to be applied to public education: Schulenburg, Marion, Flatonia, Luling, Wilmar, Waelder and Columbus, $2,000 each, and to Harwood and Ellinger, $1,000 each; to his Trustees for the maintenance of a course of free lectures at Topsfield, $500 yearly until his son's twenty-first birthday. His Trustees are instructed to pay over $500 yearly to the Consumptive's Home, a corporation of Massachusetts, until his son's twenty-first birthday. The will was filed for probate in the Essex County Probate Court, at Salem. The estate amounts to several millions.

—Ex-Governor John B. Page died at his home at Rutland, Vt., Oct. 24, very suddenly. He was attacked with bronchial pneumonia a week before, but the disease had not gained great headway, and there was little thought of danger. It is supposed that the breaking of a blood vessel, or something of the sort, was the immediate occasion of death. John B. Page, son of William Page, himself a leading man, was born in Rutland, Feb. 25, 1826; he had a common school and academy education, entered the bank of which his father was an officer, and at the age of 22 became Cashier, acted as cashier until he became President, and held this place until the bank went out of business a year ago. He was active in a great many other business enterprises, managed the Rutland & Burlington Railroad as trustee for the bondholders, and as President of the (reorganized) Rutland Railroad Co. from 1860 to 1883. He was for a time Vice-President of the Central Vermont Co., had a large interest in the Dorset Marble Co., and bought the Howe Scale Works from Brandon in 1878, and has since been at the head of the corporation. He held local offices of trust without number, was a member of the Vermont House in 1852, 1853, 1854 and 1880. He was State Treasurer from 1860 to 1864, and was elected Governor in 1867 and 1868. In 1883 Gov. Page was set aside, a new board being elected by the stockholders of the Rutland Co., his opponents alleging he was responsible for the deficit then existing in the treasury. A suit was begun last spring, the railroad *vs.* Page, to recover said deficit. The trial lasted eight weeks, and the verdict was $1 and costs.

## TRAFFIC AND EARNINGS.

### Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

| | 1885. | 1884. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| *Nine months to Sept. 30:* | | | | |
| Cin., W. & Balt.. | $1,249,215 | $1,360,201 | D. $110,986 | 8.2 |
| E. Ten., Va. & G. | 2,898,432 | 2,824,350 | I. 74,082 | 2.6 |
| Mar'q., H. & O.... | 645,990 | 704,935 | D. 58,945 | 8.4 |
| N. Y. Sus. & W.. | 803,518 | 750,190 | I. 53,328 | 7.1 |
| Northern Cen.. | 3,965,618 | 4,085,008 | D. 119,390 | 2.9 |
| Net earnings... | 1,561,999 | 1,529,981 | I. 32,018 | 2.1 |
| Pennsylvania..... | 33,236,640 | 36,398,108 | D. 3,161,468 | 8.7 |
| Net earnings... | 11,220,670 | 13,542,265 | D. 2,321,289 | 17.1 |
| Phila. & Reading. | 21,093,193 | 23,161,923 | D. 2,068,730 | 8.9 |
| Net earnings... | 8,576,121 | 9,765,637 | D. 1,189,516 | 12.2 |
| *Eight months to Aug. 31:* | | | | |
| Gal., Ha. & S. An | $1,903,358 | $1,718,808 | I. $184,550 | 10.7 |
| Net earnings .. | 829,656 | 355,411 | I. 474,245 | 133.4 |
| Louisiana West.. | 377,812 | 285,197 | I. 92,615 | 32.5 |
| Net earnings.. | 191,776 | 111,728 | I. 80,048 | 71.5 |
| Morgan's La. & T. | 2,433,391 | 2,086,604 | I. 346,787 | 16.6 |
| Net earnings... | 643,778 | 568,767 | I. 75,011 | 13.2 |
| Tex. & N. Orl'ns. | 631,271 | 541,596 | I. 89,675 | 16.6 |
| Net earnings... | 276,253 | 195,946 | I. 80,307 | 41.0 |
| *Month of August:* | | | | |
| Gal., H. & S. An. | $270,235 | $226,751 | I. $43,484 | 19.2 |
| Net earnings... | 128,838 | 75,762 | I. 53,076 | 70.0 |
| Louisiana West.. | 47,439 | 37,073 | I. 10,366 | 28.0 |
| Net earnings.. | 22,315 | 18,206 | I. 4,109 | 22.6 |
| Morgan's La. & T. | 323,966 | 246,795 | I. 77,171 | 31.2 |
| Net earnings... | 106,982 | 50,636 | I. 56,346 | 111.3 |
| Tex. & N. Orl'ns. | 98,489 | 75,591 | I. 22,898 | 30.3 |
| Net earnings... | 52,754 | 31,102 | I. 21,652 | 69.6 |
| *Month of September:* | | | | |
| Buff., N. Y. & Pa. | $238,398 | $221,868 | I. $14,530 | 6.5 |
| Net earnings... | 91,709 | 72,672 | I. 19,037 | 26.1 |
| Cin., W. & Balt. | 151,291 | 186,055 | D. 34,764 | 18.5 |
| E. Ten., Va. & G. | 379,424 | 369,311 | I. 10,113 | 2.7 |
| Net earnings... | 162,534 | 159,201 | I. 3,333 | 2.1 |
| Marq., H. & O.. | 117,198 | 102,828 | I. 14,370 | 14.0 |
| N. Y., Sus. & W. | 105,354 | 95,417 | I. 9,937 | 10.5 |
| Net earnings.. | 51,988 | 43,697 | I. 8,291 | 19.0 |
| Northern Central. | 504,753 | 476,811 | I. 27,942 | 5.8 |
| Net earnings... | 227,277 | 191,494 | I. 35,783 | 18.7 |
| Pennsylvania..... | 4,276,628 | 4,458,871 | D. 182,243 | 4.1 |
| Net earnings... | 1,891,970 | 1,887,314 | I. 4,656 | 0.3 |
| Phila. & Reading | 2,800,327 | 2,876,451 | D. 76,124 | 2.6 |
| Net earnings... | 1,305,923 | 1,324,827 | D. 18,904 | 1.4 |
| *Third week in October:* | | | | |
| Canadian Pacific. | $204,000 | $185,000 | I. $19,000 | 10.3 |
| Chi. & Alton.... | 187,148 | 222,399 | D. 35,251 | 16.0 |
| Chi. & East. Ill.. | 43,325 | 39,988 | I. 3,337 | 8.3 |
| Chi., Mil. & St. P. | 637,000 | 562,114 | I. 74,886 | 13.3 |
| Chi. & Nor'west. | 630,000 | 558,500 | I. 71,500 | 12.8 |
| Ch., St. P., M. & O. | 148,100 | 143,600 | I. 4,500 | 3.1 |
| Chi. & W. Mich.. | 27,065 | 27,640 | D. 575 | 2.1 |
| Det., Lan. & No. | 29,019 | 28,735 | I. 284 | 1.0 |
| Long Island..... | 56,768 | 50,086 | I. 6,782 | 13.6 |
| Louis. & Nash... | 288,725 | 307,290 | D. 18,565 | 6.0 |
| Mil., L. S. & W.. | 36,580 | 24,050 | I. 12,530 | 52.2 |
| St. L. & San F.. | 107,700 | 110,200 | D. 2,500 | 2.3 |

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

### Coal.

Coal tonnages for the week ending Oct. 17 are reported as follows:

| | 1885. | 1884. | Inc or Dec. | P.c. |
|---|---|---|---|---|
| Anthracite..... | 776,282 | 897,537 | D. 121,255 | 13.5 |
| Eastern bituminous..... | 199,488 | 198,646 | I. 842 | 0.4 |
| Coke..... | 50,874 | 43,978 | I. 6,896 | 15.7 |

The anthracite market is active, the usual fall demand for domestic uses having begun, although somewhat later than usual. Just now there is some pressure to fill orders for New England points before navigation closes or becomes difficult. The bituminous trade at tidewater is also active.

The coal tonnage of the Pennsylvania Railroad for the week ending Oct. 17 was:

| | Coal. | Coke. | Total. | 1884. |
|---|---|---|---|---|
| Line of road.... | 174,054 | 49,643 | 223,697 | 183,918 |
| From other lines. | 108,065 | 1,231 | 109,296 | 74,680 |
| Total..... .... | 282,119 | 50,874 | 332,993 | 258,598 |
| Year to Oct. 17. | 8,803,087 | 2,019,964 | 10,823,051 | 10,506,913 |

Increase for the week, 74,395 tons, or 28.7 per cent.; increase for the year, 317,038 tons, or 3.0 per cent.

The coal tonnage of the Chesapeake & Ohio Railroad for the nine months to Sept. 30 was:

| | 1885. | 1884. | Increase. | P. c. |
|---|---|---|---|---|
| Coal..... ..... | 850,258 | 646 089 | 204,169 | 31.6 |
| Coke..... ..... | 91,817 | 53,777 | 38,040 | 70.7 |
| Total ... ..... | 942,075 | 699,866 | 242,209 | 34.6 |

Cumberland coal shipments for the week ending Oct. 17 were 48,692 tons. Total to Oct. 17 this year, 2,181,881; last year, 2,280,229; decrease, 98,348 tons, or 4.3 per cent.

Anthracite coal tonnage passing over the Shamokin Division, Northern Central Railway, for the nine months to Oct. 3, was 731,089 tons; last year, 769,769; decrease, 38,680 tons, or 5 per cent.

Cumberland coal shipments for the week ending Oct. 24 were 61,578 tons. Total to Oct. 24 this year, 2,243,459; last year, 2,347,243; decrease, 103,784 tons, or 4.4 per cent.

Pennsylvania Railroad coal tonnage for the week ending Oct. 24 was:

| | Coal. | Coke. | Total. | 1884. |
|---|---|---|---|---|
| Line of road..... | 145,772 | 52,980 | 198,752 | 186,526 |
| From other lines... | 96,246 | 1,171 | 97,417 | 74,697 |
| Total..... | 242,018 | 54,151 | 296,169 | 261,223 |
| Year to Oct. 24.... | 9,045,105 | 2,074,115 | 11,119,220 | 10,767,236 |

Increase for the week, 34,946 tons, or 13.4 per cent.; increase for the year, 351,984 tons, or 3.3 per cent.

### Anthracite Coal Tonnage.

Anthracite coal tonnage for September and the nine months to Sept. 30 is reported as follows by Mr. John H. Jones, the Official Accountant, the statement including the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines:

| | September | | Nine months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Phila. & Reading...1, | 166,062 | 982,447 | 8,133,291 | 7,975,657 |
| Lehigh Valley..... ... | 651,033 | 498,140 | 4 117,110 | 4,241,349 |
| Del., Lack. & West.. | 524,016 | 432,688 | 3,428,492 | 3,716,033 |
| Del. & Hud. Canal Co. | 359,961 | 303,825 | 2,211,416 | 2,426,912 |
| Pennsylvania R. R.. | 331,182 | 295,095 | 2,442,178 | 2,354,268 |
| " Coal Co. | 161,154 | 121,735 | 1,012.148 | 996,494 |
| N. Y., L. E. & W..... | 65,775 | 43,962 | 440,787 | 281,654 |
| Total.... .....3,259,183 | | 2,677,890 | 21,785,422 | 21,992,367 |

Increase for the month, 581,293 tons, or 21.7 per cent.; decrease for the year, 206,945 tons, or 0.9 per cent.

The percentage of the tonnage credited to each company for the nine months is as follows, comparison being made with the allotment agreed on for the present year, and with the division for the nine months of last year:

| | Allotment. | 1885. | 1884. |
|---|---|---|---|
| Philadelphia & Reading.... ..... | 38.85 | 37.3 | 36.3 |
| Lehigh Valley ..... | 19.60 | 18.9 | 19.3 |
| Delaware, Lackawanna & Western.... | 16.05 | 15.7 | 16.9 |
| Delaware & Hudson Canal Co..... | 11.00 | 10.2 | 11.0 |
| Pennsylvania Railroad Co..... .. | 8.00 | 11 2 | 10.7 |
| Pennsylvania Coal Co..... ..... | 5.00 | 4.7 | 4.5 |
| New York, Lake Erie & Western..... | 1.50 | 2.0 | 1.3 |
| Total..... ... ... .. .....100.00 | | 100.0 | 100.0 |

The Pennsylvania Railroad Co. is not a party to the agreement. The total allotment for the nine months was 21,400,000 tons; that for October is 3,250,000 tons.

The stock of coal on hand at tidewater shipping points, Sept. 30, 1885, was 815,907 tons; on Aug. 31, 1885, 988,782 tons; decrease, 172,875 tons, or 17.5 per cent., during the month.

### Cotton.

Cotton movement for the week ending Oct. 23 is reported as follows, in bales:

| | 1885. | 1884. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| *Interior markets:* | | | | |
| Receipts.... .. .....178,737 | | 159,808 | I. 18,929 | 11.8 |
| Shipments..... ...136,687 | | 122,951 | I. 13,736 | 11.2 |
| Stock, Oct. 23 .. ..... | 161,182 | 129,511 | I. 31,671 | 24.4 |
| *Seaports:* | | | | |
| Receipts.. .. .....261,704 | | 285,112 | D. 23,408 | 8.2 |
| Exports .... .....153,029 | | 156,667 | D. 3,638 | 2.3 |
| Stock, Oct. 23.. ..... | 534,773 | 542,237 | D. 7,464 | 1.4 |

The total shipments from plantations for the crop year (from Sept. 1) to Oct. 23 are estimated at 1,317,672 bales, against 1,311,047 last year, 1,461,051 in 1883 and 1,335,555 in 1882.

### Southern Railway and Steamship Association.

The Board of Arbitration has recently made a number of decisions of some importance, of which the following is a brief summary:

1. On the motion of the Executive Committee, that the rates from eastern cities to Atlanta, Chattanooga, Montgomery, Selma, etc., be reduced, the Board decides that no reduction shall be made.

2. The Board decides that the division line between eastern and western business, through Augusta to Macon and Live Oak, shall stand. The motion was to strike out Macon and Live Oak and insert Charleston in their place.

3. The Board decides that the Georgia Railroad shall have 40 per cent. of the merchandise to and 55 per cent. of the cotton from Athens, Ga.; the Northeastern Railroad to have 60 per cent. of the merchandise and 45 per cent. of the cotton.

4. The Board decides that the Western & Atlantic Co. shall pay one-half of the claims of the Louisville & Nashville for car mileage on Green Line cars going north, which had not gone south over its line.

5. The Board decides that the Ohio River basis shall be maintained in making rates from points on the Ohio and Mississippi, to Chattanooga and to points south of the Memphis & Charleston and east of the Mobile & Ohio road, and that Green Line business shall be divided between the Cincinnati, New Orleans & Texas, the Vicksburg & Meridian, the Louisville & Nashville, and the Nashville, Chattanooga & St. Louis road, for one year from Aug. 1, 1885, the proportion of each road to be fixed by a further arbitration. The Board further decides that the Memphis basis shall be applied in making rates from Huntington, Miss., to Vicksburg and New Orleans to points in association territory.

The Executive Committee met in Atlanta, Ga., Oct. 21. It was decided to make no change in cotton rates. Several other points were discussed; the principal matters being the construction of contracts as to what constitutes an initial road, and the division of the cotton business at Montgomery. No conclusion was reached, and it was decided to refer both these points to the arbitrators.

### Chicago Traffic Meetings.

Nov. 5 a meeting of general managers and general passenger agents of Western railroads is to be held in Chicago, at Commissioner Midgeley's office, to make arrangements for restricting the issue of passes and reductions in rates for tickets.

At the same time the general managers will consider the proposition to abolish the difference between car-load and less than car-load rates on westward shipments.

Nov. 7 there will be a meeting of representatives of the railroads in the Colorado-Utah pool. It is reported that the Central Pacific is a debtor for about $45,000 in this pool, and that it declines to pay because of an alleged violation of the agreement by the Denver & Rio Grande in carrying coke from Colorado to Salt Lake City for $13 per ton, instead of $16.

### Transcontinental Association.

A dispatch from Chicago, Oct. 26, says: "At the request of the Southern Pacific the Burlington Railroad has withdrawn its notice of withdrawal from the Transcontinental Association Nov. 6, and fixed it at Nov. 30. This action is something of a surprise for the reason that the Burlington was driven to withdrawal by the refusal of the Southern Pacific to honor drafts made upon it for overpaid precentages. It is probable that a meeting of the association will be held in San Francisco the latter part of November and an effort made to settle the differences in the association."

### Southern Passenger Rates.

Cutting of passenger rates to Tennessee and Georgia points continues, and the East Tennessee Co. has lately extended the war by opening offices at Nashville and other points in Louisville & Nashville territory.

### Chicago, St. Louis & Missouri River Association.

A meeting will be held in Chicago, Nov. 6, when the following subjects will be presented for consideration: 1. Redemption of foreign coupons, when exposed for sale at association points. 2. The application of your agreement to relations with connecting lines. (These subjects are now before a committee of general passenger agents, and I hope to be able to submit their recommendation.) 3. Transportation of jewelers' sample trunks and other valuable baggage. 4. Method of dealing with the local press. 5. Restricted issue of commercial mileage tickets. 6. Disposition of amount accruing from fines levied.

## OLD AND NEW ROADS.

**Albemarle & Raleigh.**—This company has executed and recorded a mortgage to secure an issue of bonds at the rate of $20,000 per mile of completed road. The company now has its line in operation from Williamston, N. C., to Tarboro, 39 miles, and the money raised from this issue of bonds is to be used to extend the road from Tarboro to Raleigh.

**Asheville & Spartanburg.**—Grading on the extension of this road from Hendersonville, N. C., to Asheville is now about completed. Track-laying was recently begun at Asheville and the rails are now down for 8 miles. It is expected that the road will be completed by the end of November.

**Baltimore & Ohio.**—The track on this company's Philadelphia branch is now laid to Chester Creek at Chester, Pa., 7 miles beyond the Delaware line, to which the rails were laid last year. A temporary bridge over the creek is completed and the work of track-laying is progressing northward. The grading is about finished as far as the Philadelphia city line.

**California Southern.**—The extension of this road from the old terminus at San Bernardino, Cal., to the junction with the Atlantic & Pacific at Waterman, is now all completed, with the exception of about 7 miles in Cajon Pass, which section includes a heavy cutting and 3 bridges. It is expected, however, that this section will be completed by the end of November and that by Dec. 1 trains can run through to San Diego.

**Canada Southern.**—This company has sold to a New York syndicate the unissued balance of second-mortgage bonds about $2,000,000. This sale will enable the company to pay off the floating debt incurred for construction work done since the road has been operated by the Michigan Central.

**Champaign, Havana & Western.**—The New York *Evening Post* says: "Mr. Anthony J. Thomas, Receiver of the Havana Division of the Wabash Road, now known as the Champaign & Havana Line, has already, out of the net earnings, paid off $22,000 of the $100,000 which the court authorized him to borrow to pay overdue taxes and put the road in proper condition to do business with safety and economy. When the corn crop begins to move Mr. T. expects to do still better. According to their statements as filed in court, the Wabash receivers during the year they managed it lost, including taxes, over $31,000 in operating this division. When, on May 27 last, this line was turned over to Mr. Thomas as the representative of the bondholders, it was in wretched condition. Since that time he has laid 17 miles of new steel rails, 43,000 new ties, lengthened out side tracks, repaired the road-bed, bridges, culverts, trestles, station-houses, etc., put in a new turn-table, restored the old connections at Decatur which had been torn up by the Wabash people, reconstructed the station-house at that place, repaired the locomotives and cars, bought 25 new coal cars, and has placed the road generally into a very good and safe condition to do the winter's business, which is likely to be large."

**Chicago, Burlington & Northern.**—The Wisconsin and Illinois companies organized under this name have been consolidated, and the necessary articles have been filed. The line, as shown by the articles, is from East Dubuque, Ill., to St. Paul and Minneapolis.

**Chicago, Burlington & Quincy.**—The new branch of this company's Burlington & Missouri River line, which has been in progress for some time, is now completed to Oberlin, Kan., 78 miles southwest from the starting point at Republican, Neb. The new branch opens up a country which is comparatively new, most of it having been heretofore some distance from any railroad.

**Chicago, Milwaukee & St. Paul.**—This company having resolved, as heretofore noted, to issue $5,000,000 new preferred stock, gives the following notice:

"Notice is hereby given that all stockholders who now appear of record will be entitled to subscribe for their *pro rata* of said preferred stock an amount equal to 10 per centum of their holdings, provided they give a written notice at the office of the company in New York on or before Nov. 16, 1885, that they will take and pay for said stock on or before Dec. 15, 1885. Stockholders who fail to give such notice, or who fail to take and pay for said stock at the time stated, will forfeit their right to take it.

"No certificate for the fraction of a share will be issued, but a receipt will be given when payment is made for the same; which receipts will be transferable without indorsement and will be convertible into certificates of stock when presented in sums of $100 or multiples thereof."

**Chicago & Northwestern.**—This company's new Northern Illinois Branch is now nearly all graded from the junction at Belvidere, Ill., southward to La Salle, 80 miles,

and track has been laid as far as Troy Grove, 64 miles, and the work is progressing steadily. This branch is built to give the company a connection with the coal mines on its line, the Northwestern having heretofore had no convenient access to a coal supply.

**Cincinnati, Hamilton & Dayton.**—This company is reported to have under consideration a lease of the Dayton & Ironton road, formerly the southeastern division of the Toledo, Cincinnati & St. Louis. The terms are said to be 35 per cent. of the gross earnings, and as a condition of the lease the road is to be changed from 3 feet to standard gauge.

The statement of the business of the road for the first six months of the fiscal year (April 1 to Sept. 30) is as follows:

| | 1884-85. | 1883-84. |
|---|---|---|
| Gross earnings | $1,378,727 | $1,466,350 |
| Operating expenses | 909,607 | 937,099 |
| Net earnings | $469,120 | $529,251 |
| Interest on bonds and guaranteed dividends | 324,158 | 334,168 |
| Balance available for dividends | $144,960 | $195,083 |
| Three per cent. dividend on common stock | 105,000 | 105,000 |
| Surplus | $39,960 | $90,083 |

The net earnings being equal to 4⅛ per cent on the common stock, a semi-annual dividend of 3 per cent was declared.

**Cincinnati, Indianapolis, St. Louis & Chicago.**—This company's statement for August is as follows:

| | 1885. | 1884. | Decrease. | P.c. |
|---|---|---|---|---|
| Earnings | $206,850 | $244,117 | $37,267 | 15.3 |
| Expenses | 117,009 | 145,918 | 28,909 | 19.8 |
| Net earnings | $89,841 | $98,199 | $8,358 | 8.4 |
| Fixed charges | 50,000 | 50,000 | ..... | .... |
| Surplus | $39,841 | $48,199 | $8,358 | 17.6 |

The surplus for July was $16,672, which, added to the above, makes a total surplus of $56,513 for the two months of the fiscal year to Aug. 31, against $70,158 last year.

**Cincinnati, Van Wert & Michigan.**—This road is now completed to West Manchester, O., 7 miles southward from the late terminus at Tecumseh and 98 miles from the northern terminus at Cecil. Trains have begun to run to the new terminus.

**Denver, Utah & Pacific.**—This company has, during the past year, extended its road to Lyons, Col., 11 miles beyond the old terminus at Longmont and 44 miles from Denver. This extension reaches a district from which a considerable traffic is expected in lumber and building stone.

**Duluth & Manitoba.**—A survey has been completed for this proposed line from Red Lake Falls, Minn., southward to a junction with the Northern Pacific road. The line runs through a very good country, and at Red Lake Falls it reaches the junction of the Clearwater and Red Lake rivers, both outlets for the pine of the Red Lake district, which contains the largest area of pine timber yet untouched in Minnesota. There is also at the falls a very large water power, which is claimed to have a capacity almost equal to that of the water power at Minneapolis.

**East Tennessee, Virginia & Georgia.**—This company makes the following statement for September and the three months of the fiscal year from July 1 to Sept. 30:

| | September. | | Three months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | $379,424 | $369,311 | $1,006,744 | $960,071 |
| Expenses | 216,890 | 210,110 | 579,537 | 586,012 |
| Net earnings | $162,534 | $159,201 | $427,207 | $374,059 |

For the three months the gross earnings increased $46,673, or 4.9 per cent., while the expenses decreased $6,475, or 1.1 per cent., the result being a gain of $53,148, or 14.2 per cent., in net earnings.

**Grand Rapids & Indiana.**—Surveys are in progress for a line from Cary, Mich., the present termnius of the Cary Branch, west by north, to Manistee, a distance of about 40 miles. Manistee is one of the most important lumber points in Western Michigan.

**Grand Trunk.**—This company's statement for August and the two months from July 1 to Aug. 31 is as follows:

| | August. | | Two months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | £251,677 | £290,798 | £507,793 | £596,358 |
| Expenses | 200,241 | 219,125 | 397,881 | 434,310 |
| Net earnings | £51,436 | £71,673 | £109,912 | £162,048 |

For the two months the gross earnings decreased £88,565, or 14.3 per cent., and the expenses £36,429, or 8.4 per cent., leaving a decrease in net earnings of £52,136, or 32.2 per cent.

For the two months the report for the controlled lines west of Detroit is as follows:

| | C. & G. T. | | D., G. H. & M. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | £86,233 | £110,916 | £40,617 | £45,183 |
| Expenses | 74,424 | 87,187 | 27,630 | 30,048 |
| Net earnings | £11,809 | £23,729 | £12,987 | £15,135 |

The Chicago & Grand Trunk thus shows a decrease in gross earnings of £24,683, or 22.2 per cent., and in net earnings of £11,920, or 50.3 per cent. The Detroit, Grand Haven & Milwaukee had a decrease of £4,566, or 10.1 per cent., in gross earnings, and of £2,148, or 12.9 per cent., in net earnings.

**Houston, East & West Texas.**—The Receiver of the Louisiana Division of this road has completed the laying of the track to the Sabine River at Logansport, 38 miles from Shreveport. On the Texas end of the line work is progressing. The Court has authorized the Receiver in Louisiana to contract for the building of the bridge over the Sabine at Logansport; half the cost of which is to be paid by the Louisiana Division and half by the Texas Division of the road. The Texas Receiver has already received authority to pay for his half of the bridge.

**Indianapolis, Peru & Chicago.**—The trustees for the bondholders took possession of this road Oct. 21, under orders of the United States Circuit Court. The road has for several years been a part of the Wabash system.

**Jacksonville, Tampa & Key West.**—The track on the extension of this road is now laid to Crescent Lake, Fla., 25 miles southward from Palatka and 81 miles from Jacksonville. The contractors, Messrs. Mason & Young, are pushing the work with the intention of completing the road to Sanford in time to secure a share of the winter travel. The bridge by which this line crosses the St. Johns River at Buffalo Bluff is 7,500 ft. long in all. There are 3,700 ft. of trestle or piled bridging on the west side of the draw and 3,500 ft. on the east side, while the draw span is 230 feet long.

**Kansas City, Clinton & Springfield.**—The tracklayers on this road, working northward from Ash Grove, Mo., have reached Vista, 58 miles. On the northern end of the road track-laying was some time ago completed from Raymore to Deepwater, 57 miles, and has recently been extended 14 miles further to Osceola. This leaves the only work required to complete the road the track-laying on the gap of 5 miles between Osceola and Vista, and the completion of the drawbridge over the Osage River.

**Kansas & Gulf Short Line.**—The track of this road was last week completed to Lufkin, Tex., the junction with the Houston, East & West Texas road. This line, which is of 3 ft. gauge, is now 90 miles long, from Tyler, Tex., to Lufkin. In connection with the Texas & St. Louis and the Houston, East & West Texas, it completes a continuous narrow-gauge line from Cairo to Houston.

**Lake Erie & Western.**—The Receiver recently made application to the Court for permission to buy 3,000 tons of steel rails, and to issue certificates in payment therefor. He has already purchased and put in the track 3,000 tons. The Court refused the permission asked, but stated that the Receiver would have leave to renew his application; but did not, however, say anything which would give grounds for any expectation that the application would be granted.

**Louisville, Evansville & St. Louis.**—An agreement of reorganization has been submitted to the holders of securities, which provides that the road should be sold under foreclosure and a new company organized. This company shall issue $1,000,000 in bonds, to be known as series A bonds, which shall be used to pay off underlying liens on the property, and to pay for equipment and improvements of the road. There shall also be isued $3,000,000 of bonds, to be known as series B, which bear no interest for eighteen months, and shall bear interest thereafter at 2 per cent. for the first year, 3 for the second, 4 for the third, 5 for the fourth, and 6 per cent. thereafter. These bonds are to be given to the present holders of first mortgage bonds. The new company shall issue preferred stock for the amount of the unpaid coupons on the first mortgage bonds and common stock for the full amount of the income bonds and one-fourth of the present common stock. This agreement is to take effect when the holders of the majority of the bonds have assented to it and have agreed to deliver their bonds to the American Loan & Trust Co. in Boston. To provide for the expenses of reorganization an assessment of $5 per bond on the first mortgage bonds, $1 per share on the preferred and 50 cents per share on the common stock is proposed.

**Maine Central.**—The following statement has been published for the eleven months of the fiscal year from Oct. 1 to Aug. 31:

| | 1884-85. | 1883-84. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | $2,530,194 | $2,512,674 | I. $17,520 | 0.7 |
| Expenses | 1,597,433 | 1,646,685 | D. 49,252 | 3.0 |
| Net earnings | $932,761 | $865,989 | I. $66,772 | 7.7 |

In this statement the August expenses are partly estimated, but the net result will differ very little, it is believed, from the actual result.

**Milwaukee, Menomonee Falls & Western.**—This company has been organized to build a railroad from Milwaukee to the stone quarries in Waukesha County.

**Napanee, Tamworth & Quebec.**—The officers of this company recently made an inspection of the proposed extension from Tamworth, Ont., to Tweed, 21 miles, walking over the line. The line is a good one, through a good country, well supplied with timber; at Tweed it will connect with the Ontario & Quebec Division of the Canadian Pacific. The road is now in operation from Tamworth to Napanee, 28 miles.

**Nashville, Chattanooga & St. Louis.**—This company's statement for September and the three months of the fiscal year from July 1 to Sept. 30 is as follows:

| | September. | | Three months. | |
|---|---|---|---|---|
| | 1885 | 1884. | 1885. | 1884. |
| Earnings | $192,865 | $210,586 | $540,648 | $616,250 |
| Expenses | 113,219 | 114,897 | 317,960 | 339,090 |
| Net earnings | $79,646 | $95,689 | $222,988 | $277,160 |
| Interest and taxes | ..... | ..... | 168,663 | 171,639 |
| Surplus | ..... | ..... | $54,325 | $105,521 |

For the three months the decrease in gross earnings was $75,602, or 12.3 per cent.; in net earnings $54,172, or 19.6 per cent., and in surplus $51,196, or 48.5 per cent.

**New Orleans & Northeastern.**—The stockholders of this company have voted to approve an issue of $1,372,000 in prior lien bonds, to take precedence of the present first-mortgage bonds, provided the holders consent. These new bonds will be used to pay the floating debt incurred for construction; to pay off equipment trust notes, and to make necessary improvements.

**New York & New England.**—At Hartford, Conn., Oct. 22, the sales of Series B of the New England Car Trust rolling stock occurred in the United States Court-room. Ten locomotives were sold for $55,250; 18 passenger coaches for $56,000, and 370 gondola cars for $101,750, making a total of $213,000. The purchase at first was for the Trustees, as in Series A, but when 210 gondola cars, 7 locomotives and 1 passenger coach had been bid off for a total of $98,400, the remaining purchases were made for Henry L. Leach, of Boston, trustee. The sale to him was $114,600. The sale yielded about 90 per cent. of the appraisal.

At a meeting of the directors in Boston, Oct. 27, it was found that only about $600,000 of the $2,000,000 of preferred shares offered to the stockholders had been taken. This was not sufficient to provide for the floating debt, and as the subscriptions were conditioned upon the whole amount being taken, they became void. It was voted to offer the preferred shares to the creditors, giving those stockholders who have subscribed the first chance to renew their subscriptions, and the President and Treasurer were appointed a committee to present the scheme to them.

President Watrous, of the New York, New Haven & Hartford Co., denies positively the rumors that his company is negotiating for a lease or purchase of the New York & New England road.

**New York, New Haven & Hartford.**—The Bridgeport, Conn., *Standard* says: "For the ballasting of the Hartford Division of the Consolidated road there was used in round numbers 800,000 tons of fine stone from the quarries at Meriden. The work now going on of ballasting the New York Division of the road keeps three trains going all the time—two carrying the broken stone ballast to New Haven and one distributing it. The work of furnishing ballast for the New York Division of the road will last for about two years."

**New York, West Shore & Buffalo.**—The New York Supreme Court has decided in the case of the claims for labor and supplies furnished prior to the appointment of the Receivers that they must be paid and the Receivers shall issue certificates to the amount required. The claims thus ordered to be paid amount to about $100,000, and are held by claimants mostly for small amounts.

**Norfolk & Western.**—This company has arranged to extend $190,000 consolidated South Side bonds, maturing Jan. 1, 1886, until Jan. 1, 1900, at 2 per cent. interest. Of these bonds $97,000 now bear 8 and $93,000 6 per cent. interest. Holders who not wish to extend their bonds will be paid in cash.

**Northern Central.**—This company's statement for September and the nine months to Sept. 30 is as follows:

| | September. | | Nine months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | $504,753 | $476,811 | $3,965,618 | $4,085,008 |
| Expenses | 277,476 | 285,317 | 2,403,619 | 2,555,027 |
| Net earnings | $227,277 | $191,494 | $1,561,999 | $1,529,981 |

For the nine months the gross earnings decreased $119,390, or 2.9 per cent., and the expenses $151,408, or 5.9 per cent., leaving a gain of $32,018, or 2.1 per cent., in net earnings.

**Northern Pacific.**—The statement for September is as follows:

| | 1885. | 1884. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | $1,224 955 | $1,236,560 | D. $11,605 | 0.9 |
| Expenses | 559,862 | 666,707 | D. 106,845 | 16.0 |
| Net earnings | $665,093 | $569,853 | I. $95,240 | 16 7 |

Taxes are included in expenses. The estimated proportion of the yearly fixed charges for September was $487,438, showing a surplus of $177,655 for the month.

**Oregon & California.**—The terms of exchange of Oregon & California securities for those of Central Pacific have heretofore been noticed. The terms of agreement have been reported more fully in the London papers, though in the absence of official documents it is not known whether all the details are correct. It is stated that the agreement "was made July 31, and by it the 451 miles of road, with its appurtenances and equipments, rights, franchises, and land grant, are to be transferred on or before July 1, 1886. The terms of the sale are as follows: For the $9,000,000 or thereabouts of first mortgage bonds now outstanding, issued at the rate of $20,000 per mile, the Central Pacific will issue bonds at the rate of $30,000 per mile to the amount of $10,500,000, payable in 40 years, bearing interest at the rate of 3 per cent. for the first two years and 5 per cent. thereafter. It is likely that the Oregon & California will transfer the property to a new company to be organized for the purpose, and that the Central Pacific will guarantee the bonds of this new company. However, the bonds may be secured by a mortgage on the property. The difference between $9,000,000, the present indebtedness, and $10,500,000, the amount of the proposed new bonds, is accounted for in this way: The present bondholders have received no interest for a year, and will receive none on Jan. 1 next. One year and a half at 6 per cent. is 9 per cent. loss. Then they will receive only 3 per cent. for the first two years; another loss of 4 per cent. So the extra issue of $1,500,000 will a little more than cover past and prospective losses. The stock of the Oregon & California is $19,000,000—$12,000,000 preferred and $7,000,000 common. This will be taken up by the issue of $8,000,000 Central Pacific stock, viz.: one share of Central Pacific stock for two shares of Oregon & California preferred, and one share of Central Pacific stock for four shares of Oregon & California common. The Central Pacific agrees to complete the connecting link between Ashland and Delta within three years of the date of the transfer, so as to form a through line between Portland and San Francisco. The contract was ratified by the stockholders at a meeting in Portland, Sept. 30, and of course it is ratified by the bondholders, for they made it."

**Oregon Railway & Navigation Co.**—This company gives notice that the principal of the scrip issues maturing Nov. 1, 1885, and Nov. 1. 1886, will be paid on presentation at the office of the Farmers' Loan and Trust Co., in New York, on and after 31. Interest will cease to run from that date. The amount of this scrip is $1,200,000, and it bears 8 per cent. interest. The issue of $1,500,000 new general mortgage bonds recently made was to pay off this scrip and some other floating debt.

**Philadelphia & Reading.**—General mortgage bondholders to the amount of over $4,000,000 have signed the petition for a foreclosure of the mortgage. A large part of the signatures were obtained through the Bartol Committee.

It is announced that the reorganization trustees have succeeded in agreeing upon a plan for the reorganization of the company, but it is not stated what the basis of the plan is. The general mortgage bondholders, however, are not willing to accept any plan which does not provide for their security, and it is now in the last degree improbable that any reorganization can be completed without a foreclosure.

The Receivers' statements give the following figures for the earnings of the railroad for September and the ten months of the fiscal year from Dec. 1 to Sept. 30:

| | September. | | Ten months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | $2,800,387 | $2,876 451 | $23,468,752 | $25,459,562 |
| Expenses | 1,494,463 | 1,551,624 | 13,910,620 | 14.808,369 |
| Net earnings | $1,305,924 | $1,324,827 | $9,498,132 | $10,651,193 |

For the ten months the gross earnings thus decreased $2,050,810, or 8.1 per cent., and the net earnings $1,153,061, or 10.8 per cent.

The traffic reported is as follows:

| | September. | | Ten months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Passengers | 2,345 2'3 | 2.344.791 | 19.511,038 | 20,136,717 |
| Tons merchandise | 854,099 | 777,079 | 6,783,889 | 7,365,370 |
| Tons coal | 1,267,616 | 1.058.206 | 9 885,564 | 9,417,668 |
| Tons coal on colliers | 52,359 | 50,866 | 461,185 | 443,632 |

For the year the traffic shows a decrease in everything but coal.

The earnings of the Philadelphia & Reading Coal & Iron Co. were:

| | September. | | Ten months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | $1,774,214 | $1,574,607 | $12,247,071 | $13,121,405 |
| Expenses | 1.834,485 | 1,507,282 | 12,526,892 | 13,334,238 |
| Deficit | $80,271 | $22,675 | $279,821 | $212,833 |

For the ten months the gross earnings decreased $874,334, or 6.7 per cent., and the deficit increased $66,988, or 31.4 per cent.

The coal mined from the company's lands was as follows:

| | September. | | Ten months | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| By company | 553,427 | 472,935 | 4,119,013 | 3,786,769 |
| By tenants | 72,793 | 60,435 | 630,153 | 609,740 |
| Total | 626,220 | 533,370 | 4,749,166 | 4,396,509 |

The decrease in earnings was thus made on an increase of 352,657 tons, or 8.1 per cent., in coal mined.

The joint net earnings of both companies were:

| | September. | | Ten months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| R. R. Co., net | $1,305,924 | $1,324,827 | $9,498,132 | $10.651,193 |
| C. & I. Co., de | 80,271 | 22,675 | 279,821 | 212,833 |
| Total net | $1,225,653 | $1,302,152 | $9,218,311 | $10,438,360 |

The total net decrease was thus $76,499, or 5.9 per cent

for September, and $1,220,049, or 11.7 per cent., for the ten months. The expenses in the statements above do not include anything for interest or rentals, the net earnings being the amounts from which those charges are to be met.

**Pennsylvania.**—This company's statement for September shows for all lines east of Pittsburgh and Erie, as compared with September, 1884, a decrease in gross earnings of $182,243; a decrease in expenses of $186,899, and an increase in net earnings of $4,656. For the nine months ending with September, as compared with the corresponding period of last year, the same lines show a decrease in gross earnings of $3,161,468; a decrease in expenses of $840,179, and a decrease in net earnings of $2,321,289.

Carrying out these changes, we have the following statement:

| | September. | | Nine months. | |
|---|---|---|---|---|
| | 1885. | 1884. | 1885. | 1884. |
| Earnings | $4,276,628 | $4,458,871 | $33,236,640 | $36,398,108 |
| Expenses | 2,384,658 | 2,571,557 | 22,015,664 | 22,855,843 |
| Net earnings | $1,891,970 | $1,887,314 | $11,220,976 | $13,542,265 |
| Per ct. of exps. | 55.8 | 57.7 | 66.2 | 62.8 |

All lines west of Pittsburgh & Erie for the nine months of 1885 show a deficiency in meeting all liabilites of $1,287,-918, being an increased deficiency as compared with the same period of 1884 of $626,059.

**Pennsylvania Slatington & New England.**—Mr. William V. McCracken has been appointed Receiver of the property of this company in New York and Pennsylvania. The proceedings in those states are ancillary to the suit in which Mr. McCracken was recently appointed Receiver in New Jersey. The company has a part of its road graded and a few miles of track laid, but no portion of it has ever been operated.

**St. Joseph & Southeastern.**—This company was recently organized to build a railroad from St. Joseph, Mo., to Smithville, in Clay County. A preliminary survey of the line has been completed, and the company now asks the city of St. Joseph for a subscription of $60,000 in aid of the construction of the road.

**St. Louis & San Francisco.**—This company has recently sold to a syndicate $1,939,000 general mortgage bonds; being balance of the total issue authorized, outside of the amount reserved to take up prior bonds. The price at which the bonds were sold is not stated.

**Salvador.**—Proposals will be received by the Secretary of Public Works of the Republic of Salvador (Central America) from Jan. 2 to Jan. 21, 1886, for the construction of a railroad from the port of La Libertad to the city of San Salvador, the capital of the Republic. The Government will guarantee interest on the capital required for construction, with the condition that at the expiration of 99 years the road shall become the property of the state. In making the award the best proposal will be considered that which includes the following conditions: 1. Conformity to excellence of technical requirements. 2. Interest on a smaller capital and for a shorter time. 3. Lowest rate of interest (the guarantee is not to exceed 8 per cent. yearly). 4. Excellence of guarantee of fulfillment of contract. 5. Requirement of exclusive rights for the shortest period. 6. Completion of work in the shortest time.

Senor Marino Pomares, Consul of Salvador at New York, may be applied to for further information.

**Sheffield Terminal.**—This company has been organized to build a railroad from a point in Sheffield, Ala., to the Tennessee River, with power to extend the same to a junction with the Memphis & Charleston road, and also to the East Tennessee state line. The road is intended to be an extension of the Sheffield & Birmingham road now under construction.

**Syracuse, Phœnix & Oswego.**—Since the completion of this road the Rome, Watertown & Ogdensburg Co. has operated it under a temporary agreement. Last week orders were received to discontinue the running of trains, but these orders were subsequently withdrawn, and it is now understood that negotiations have been completed for a permanent lease of the road.

**Toledo, Cincinnati & St. Louis**—The sale of the rolling stock owned by the Massachusetts Car Trust, and in use on this road, was completed last week. Most of the cars were bought in by the bondholders' committee at extremely low prices.

The Receiver recently made application to the Court for authority to issue certificates to a large amount, for the purpose of making repairs and renewals on the road. He represented that the road was in a very unsafe condition. The application was opposed by the counsel for the bondholders, and after consideration the Court refused to allow any further issue of certificates. Judge Gresham said that, if the Receiver was prepared to make affidavit that the road could not be operated without danger to life, he would at once order it to be closed and direct all train service to be abandoned, but in the present condition of its affairs he was not prepared to authorize the imposition of any additional burden prior to the first mortgage bonds.

**Toledo & Ohio Central.**—This company (Ohio Central reorganized) has made application to have its first mortgage 5 per cent. gold bonds listed at the New York Stock Exchange, and the statement submitted contains the following: These are $3,000,000 first mortgage 5 per cent. 50 year gold bonds upon 196 miles of completed road, and also 17 miles of leased road, with interest guaranteed by the Columbus, Hocking Valley & Toledo Co. The Toledo & Ohio Central Railway Co. was incorporated June 30, by filing articles of incorporation with the Secretary of the State of Ohio under the general Ohio railroad law.

This road is what was formerly known as the main line of the Ohio Central Railroad Co., sold under decree of the U. S. Circuit Court for the Northern District of Ohio, on April 15, 1885, at Toledo, O., and purchased by the reorganization committee for the bondholders and stockholders. At its incorporation June 30, 1885, it had as assets, the road and equipment; supplies on hand, $88,015; bonds, $83,000; and sundry cash balances awaiting the decision of the court. It had as liabilities nothing whatever except the $3,000,000 mortgage bonds. Its capital stock consists of preferred $3,750.000; common, $1,600,000.

Of the bonds, $2,504,000 have been issued to date, through the Central Trust Co. of New York, under the plan of reorganization, to the holders of the old main line first mortgage Ohio Central Railway bonds, who assented to the reorganization, and held Central Trust Co.'s certificates of deposit therefor. Of the remaining, there are in the Central Trust Co.'s hands $413,000 ready for delivery to the holders of the outstanding certificates of deposit of same bonds upon presentation; and $83,000 bonds will remain the property of the Toledo & Ohio Central Railway Co., the holders of that amount of the old bonds not having come into the plan of reorganization.

By the mortgage and the bond the $3,000,000 are part of a series of $5,000,000. But none of the remaining $2,000,-000 are to be issued except for property hereafter acquired, and then only with the consent of the holders of three-fourths of the bonds outstanding, as provided in the mortgage.

Particular attention is called to the provisions in Article 2 of the mortgage, under which the trustee shall at any time, when requested by the holders of one-fourth of these bonds, ascertain the condition of the railway property and of its equipments, and if the same are not in good order, the trustee shall compel the company to put the same in good order, and if not so put, the trustee shall exercise the right of entry and of sale and foreclosure. The bonds are issued in denominations of $1,000 each, numbered from 1 to 3,000.

**Union Pacific.**—The land sales in September were 48,-203 acres, for $169,312. For the nine months to Sept. 30 the sales were 559,014 acres from the Union Division lands, and 492,830 acres from the Kansas Division, a total of 1,051,844 acres for $2,972,327. This is only about one-fourth of the acreage, and one-third of the amount for the corresponding period of 1884.

**Vicksburg & Meridian.**—The stockholders and bondholders of this company have authorized the issue of preferred or prior lien mortgage bonds to the amount of $7,000 per mile, to bear 6 per cent. interest. These bonds are to be used to pay the cost of the change of gauge and of the river transfer at Vicksburg, and to provide for necessary improvements of the road. The incline at Vicksburg is completed and transfers of cars across the river to the Vicksburg, Shreveport & Pacific road by ferry boat have commenced. The gauge of this road was changed from 5 ft. to standard Oct. 23, and there is now no obstacle to running through cars and the shipment of freight without transfer.

**Vicksburg, Shreveport & Pacific.**—The stockholders have voted to issue prior lien bonds to the amount of $7,000 per mile, to bear 6 per cent. interest. These bonds will be used chiefly to pay off the advances made for construction by the Cincinnati, New Orleans & Texas Pacific Co., and other floating debts.

## ANNUAL REPORTS.

The following is an index to the annual reports which have been reviewed in previous numbers of the current volume of the *Railroad Gazette*:


| | Page. | | Page. |
|---|---|---|---|
| Alabama Great Southern | 358 | Little Miami | 448 |
| Ala., N. O., Tex. & Pac. Junc | 608 | Little Rock & Fort Smith | 544 |
| Allegheny Valley | 559 | Long Island | 21 |
| Alliance, Niles. & Ash | 576 | Louisiana & Mo. River | 527 |
| Ashtabula & Pittsburgh | 576 | Louisiana Western | 247 |
| Atchison, Top. & Santa Fe | 126, 382 | Louisville & Nashville | 560 |
| Atlantic & Pacific | 448 | Maine Central | 36 |
| Atlanta & West Point | 493 | Marquette, Hough. & Ont. | 277, 391 |
| Baltimore & Potomac | 407 | Masillon & Cleveland | 576 |
| Bay View, L. Traverse & Mack. | 640 | Memphis & Charleston | 527 |
| Belt Ry., of Chicago | 431 | Mexican Central | 229 |
| Boston, Concord & Montreal | 342 | Michigan Central | 205 |
| Boston, Hoosac T. & West. | 151, 560 | Mil., Lake Shor- & Western | 205 |
| Boston & Lowell | 22 | Minneapolis & St. Louis | 511 |
| Brunswick & Western | 101 | Missouri, Kansas & Texas | 528 |
| Buffalo, N. Y. & Phila | 58 | Missouri Pacific | 87, 528 |
| Bur., Cedar Rapids & No. | 608 | Mobile & Girard | 496 |
| Camden & Atlantic | 167 | Montpelier & Wells River | 480 |
| Canadian Pacific | 407 | Nash., Chattanooga & St. L | 624 |
| Carolina Central | 310 | Natchez, Jackson & Col | 71 |
| Central Iowa | 215 | New Brighton & New Castle | 576 |
| Central Pacific | 128, 464, 479 | New Castle & Beaver Vy | 576 |
| Central Vermont | 342 | New Haven & Northampton | 82 |
| Charlotte, Col. & Augusta | 384 | N. Y., Chicago & St. Louis | 151, 311 |
| Chartiers | 448 | N. Y. & Greenwood Lake | 407 |
| Chesapeake & Ohio | 215 | N. Y., N. Haven & Hartford | 7 |
| Chesapeake, Ohio & S. W | 512 | N. Y., Ontario & Western | 7 |
| Cheshire | 101 | N. Y., Pennsylvania & Ohio | 407 |
| Chicago & Alton | 183 | N. Y. Providence & Boston | 71 |
| Chi. & Atlantic | 6-6 | N. Y. Railroad Commission | 31 |
| Chi., Burlington & Quincy | 183, 228 | N. Y., Susquehanna & Wes'rn | 359 |
| Chi., Milwaukee & St. P | 101, 167 | N. Y., West Shore & Buffalo | 7 |
| Chi. & Northwestern | 496 | Norfolk & Western | 86, 311 |
| Chi., Rock Island & Pac | 324, 432 | Northeastern (South Carolina) | 151 |
| Chi., St. Louis & Pittsburgh | 544 | Northern Central | 135 |
| Chi., St. P., Minn. & Omaha | 495 | Northern (New Hampshire) | 325 |
| Chic. & Western Indiana | 431 | Northern Pacific | 624 |
| Chi. & West Michigan | 592 | Northwestern Ohio | 576 |
| Cin., Hamilton & Dayton | 407 | Ogdensburg & L. Champlain | 479 |
| Cin., Ind., St. L. & Chicago | 656 | Pacific Mail Steamship Co | 343 |
| Cin. & Muskingum Valley | 448 | Panama | 544 |
| Cin., N. Orleans & Tex. Pacific | 183 | Pennsylvania Company | 576 |
| Cin., Richmond & Ft. Wayne | 240 | Pennsylvania & New York | 464 |
| Cin., Wash. & Baltimore | 688 | Pennsylvania Railroad | 150 |
| Cleve., Col., Cin. & Ind | 213 | Peoria, Decatur & Evans | 214 |
| Cleve., Lorain & Wheeling | 342 | Petersburg | 183 |
| Cleve. & Pittsburgh | 576 | Philadelphia & Reading | 37, 53 |
| Columbia & Greenville | 406 | Phila., Wil. & Baltimore | 192 |
| Concord | 324 | Pitts. & Castle Shannon | 128 |
| Conn. & Passumpsic Rivers | 592 | Pitts., Cincinnati & St. L | 448 |
| Connecticut Valley | 310 | Pitts., Ft. W. & Chic | 342, 480, 576 |
| Cumberland Valley | 560 | Pittsburgh & Lake Erie | 37 |
| Del. & Hudson Canal Co | 101, 343 | Pitts., Wheeling & Ky | 448 |
| Del., Lacka. & Western | 134 | Portland & Rochester | 7 |
| Denver & Rio Grande | 432 | Portland & Ogdensburg | 263 |
| Detroit, Lansing & No | 608 | Richmond & Alleghany | 229 |
| Eastern R. R. Association | 273 | Rich. & West Pt. Terminal Co. | 263 |
| East St. L. & Carondelet | 576 | Rochester & Pittsburgh | 71 |
| Eliz., Lex. & Big Sandy | 111 | Rome, Wat. & Ogdensburg | 7 |
| Erie & Pittsburgh | 576 | Rutland | 479 |
| Fitchburg | 23 | St. L., Alton & Terre Haute | 480 |
| Flint & Pere Marquette | 592 | St. L., Iron Mountain & So | 528 |
| Florida Ry. & Nav. Co | 656 | St. L. & San Francisco | 343 |
| Fort Worth & Denver City | 37 | St. L., Vandalia & Terre Haute | 128 |
| Galveston, Har. & San Ant | 688 | St. Paul & Duluth | 134 |
| Galveston, Houston & Hen | 528 | St. Paul, Minn. & Man | 575, 607 |
| Georgia Pacific | 357 | Savannah, Florida & West | 294 |
| Georgia Railroad | 324 | Seaboard & Roanoke | 295 |
| Grand Rapids & Indiana | 640 | Shenandoah Valley | 480 |
| Grand Trunk | 277 | South Carolina | 183 |
| Green Bay, Winona & St. P | 623 | Southern Pacific (Cal.) | 358 |
| Gulf, Colorado & Santa Fe | 391 | Terre Haute & Indianapolis | 198 |
| Hannibal & St. Joseph | 656 | Terre Haute & Logansport | 198 |
| Han. June., Han. & Gettysb'g | 391 | Texas & New Orleans | 247 |
| Hartford & Conn. Western | 71 | Texas & Pacific | 167, 527 |
| Housatonic | 167 | Toledo, Ann Arbor & N. Mich. | 294 |
| Huntingdon & Broad Top Mt | 101 | Traverse City | 640 |
| Illinois Central | 53, 134 | Troy & Greenfield | 407 |
| Indianapolis & Vincennes | 576 | Union Pacific | 160 |
| International & Gt. Northern | 528 | Utah Central | 325 |
| Iron | 511 | Utica & Black River | 128 |
| Jeff., Madison & Indianapolis | 576 | Vicksburg & Meridian | 391 |
| Kan. City, Ft. Scott & Gulf | 512 | Virginia Midland | 27 |
| Kan. City, Spring & Memphis | 512 | Western North Carolina | 247 |
| Kan. City, St. J. & Council Bl | 656 | West Jersey | 687 |
| Kentucky Central | 214, 688 | Wilmington & Northern | 479 |
| Lake Shore & Mich. So | 294, 310 | Wisconsin Central | 432 |
| Lawrence | 215, 576 | Worcester, Nashua & Roch | 7 |
| Lehigh Coal & Navigation Co | 128 | York & Peachbottom | 310 |
| Lehigh Valley | 52, 464 | | |


## Grand Trunk.

The report of this company for the half-year ending July 30 last covers 2,977 miles of road, the operations of the Welland Railway, leased from May 1, 1884, being included in both years. Comparisons are made with the corresponding half of 1884.

During the half-year, £299,740 of perpetual 4 per cent. consolidated debenture stock was issued at an average price of slightly over £79 per £100, and the amount so issued has been credited to capital account. The total renewal account stands at £40,465, against £39,053 Dec. 31, 1884.

The renewal account amounts to £21,263, against a sum of £51,876 June 30, 1884.

The earnings for the half-year were:

| | 1885. | 1884. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | £1,423,857 | £1,612,348 | D. £188,491 | 11.7 |
| Expenses | 1,090,737 | 1,178,030 | D. 87,293 | 7.4 |
| Net earnings | £333,120 | £434,318 | D. £101,198 | 23.3 |
| Per cent. of exps | 76.6 | 73.1 | I. 3.5 | ..... |

The decrease in earnings was due to general depression in business; to local depression from special causes, such as the small-pox epidemic in Montreal, and especially to the very low rates on almost all traffic. Expenses were reduced, but no possible reduction could be made to meet the falling off in gross receipts.

The income account was as follows:

| | | |
|---|---|---|
| Net earnings for the half-year | | £333,120 |
| Interest on investments, etc | | 24,871 |
| Total | | £357,991 |
| Interest on bonds | £44,202 | |
| " debenture stock | 207,381 | |
| " subsidiary lines | 76,244 | |
| Rents of leased lines | 78,471 | |
| | | 406,298 |
| Deficit for the half-year | | £48,307 |

The report says: "From the above sum of £48,307 has to be deducted the balance brought forward from the half-year ended Dec. 31, 1884, of £1,492, leaving £46,815 as the net deficiency on June 30, 1885. As against the above deficiency, the company has received during the half-year £11,-473, the amount of a claim by the late Great Western Co. against the city of Grand Haven, which had not been credited as an asset in the books of the company; and £37,094 by the sale of £41,100 bonds of the Grand Trunk, Georgian Bay & Lake Erie Co., made principally since June last. These two sums, amounting to £48,567, have not, however, been applied in the accounts of the past half-year to meet the deficiency of £46,815 above referred to, as it is thought better to postpone any decision in regard to their ultimate application until the results of the whole year of 1885 have been ascertained."

The report speaks at length of the condition of through traffic and the negotiations for a restoration of rates. As to other matters it says:

"As regards the North Shore, the shareholders will remember that at the general meeting on March 29, 1883, an agreement between the North Shore Railway Co. and the Grand Trunk Company, dated Feb. 27, 1883, was approved and ratified. The shareholders were further informed at that meeting that this company had invested £34,000, and the Central Vermont Co. £16,000, in the purchase, respectively, of $680,000 and $320,000, being the whole of the ordinary stock of the North Shore line, amounting to $1,000,000; and that the control of that line was thus secured to this company. The Central Vermont and this company were mutually interested in the development of the business between the North Shore line and their respective systems, and the arrangements then made proved satisfactory to all parties. When, recently, it appeared that there was a desire that the city of Quebec should obtain direct connection with the Canadian Pacific Railway, the Grand Trunk Co. offered to share the proprietorship and working of the North Shore line with the Canadian Pacific Co., but that offer did not prove acceptable to the Government. The Dominion Parliament authorized last year, and confirmed by a further act, with a larger subsidy, in the present year, the construction of another line between Montreal and Quebec, and voted $1,500,000 as a total subsidy for that purpose; and the act of last session further provided that if in two months from the passing of the act (on July 20, 1885), the Canadian Pacific Co., or the Government in the interest of that company, failed, either to purchase or to obtain control of the North Snore Railway, then certain subsidies (a portion of the $1,500,000 already referred to), which had expired, should be continued for the purpose of constructing a new line between Montreal and Quebec. There have been from time to time prolonged negotiations on the subject; but after the passing act of this year it became necessary for the Grand Trunk Co. to decide, on or before Sept. 20 last, whether the company would sell its interest in the North Shore Railway to the Government, on such terms as could be obtained, or whether the company would, in retaining the control of the North Shore Railway, incur the risk of the construction and competition of another and an unnecessary line, for which, as already stated, a subsidy had been voted. Under these circumstances the board decided that the best course which they could adopt in the interest of the proprietors was to comply with the wishes of, and to transfer the line to, the Government; which was accordingly, after much anxious negotiation as to the precise terms to be obtained, carried out on Sept. 22 last. The purchase money finally agreed to be paid by the Government was $525,000 (£105,000). This amount was to repay the Grand Trunk and Central Vermont companies the sum of £34,000 and £16,000 respectively, formerly paid for the ordinary stock, and to provide £55,000 to meet the liabilities of the North Shore Co. Any balance remaining will be applied toward the cost of the Jacques Cartier Union Railway, 7 miles long, which was constructed to connect the Grand Trunk system at Montreal with the North Shore and Canadian Pacific railways, and which remains in the possession of the Grand Trunk Co.

"An agreement, dated July 22, 1885, between the Central Vermont Railroad and this company, will be submitted to the shareholders for their approval. This agreement provides that the Central Vermont Co. shall transfer to the Grand Trunk Co., in pursuance of former arrangements, 4,570 shares of its capital stock, thereby securing to the Grand Trunk Co. one-half interest in the ordinary stock of the Central Vermont Railway. In return, the Grand Trunk Co. undertakes to foster and promote the development of the traffic between the respective lines, and to enter into arrangements for rates, fares and trains for the mutual advantage. No monetary liability attaches to this company in respect of this agreement."

The statements for the controlled lines west of Detroit and Port Huron are as follows:

### DETROIT, GRAND HAVEN & MILWAUKEE.

The earnings of this road for the half-year were:

| | 1885. | 1884. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | £101,973 | £115,531 | D. £13,558 | 11.5 |
| Expenses | 81,966 | 90,193 | D. 8,227 | 9.1 |
| Net earnings | £20,007 | £25,338 | D. £5,331 | 11.3 |
| Per cent. of exps | 80.4 | 78.1 | I. 2.3 | .... |

The debit balance carried forward June 30 was £12,055, against £5,998 on June 30, 1884.

### CHICAGO & GRAND TRUNK.

The operations of this line for the half-year were as follows:

| | 1885. | 1884 | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | £272,593 | £312,282 | D. £39,689 | 12.7 |
| Expenses | 237,477 | 257,454 | D. 19,977 | 7.8 |
| Net earnings | £35,116 | £54,828 | D. £19,712 | 36.0 |
| Per cent. of exps | 87.1 | 82.4 | I. 4.7 | ..... |

There is a debit balance to be carried forward to the accounts for the next six months of £49,459, as compared with a debit balance of £18,137 carried forward from June 30, 1884.

The decrease on this road is entirely due to the low rates on through traffic, which so seriously affected all the company's lines.